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Volume 19 October 1950 Number 10

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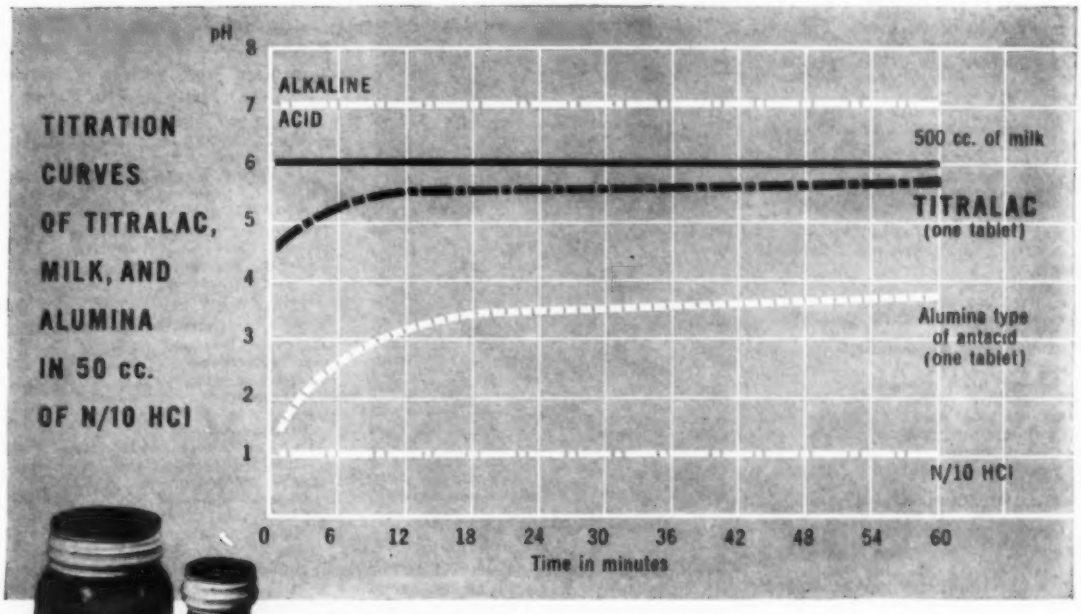

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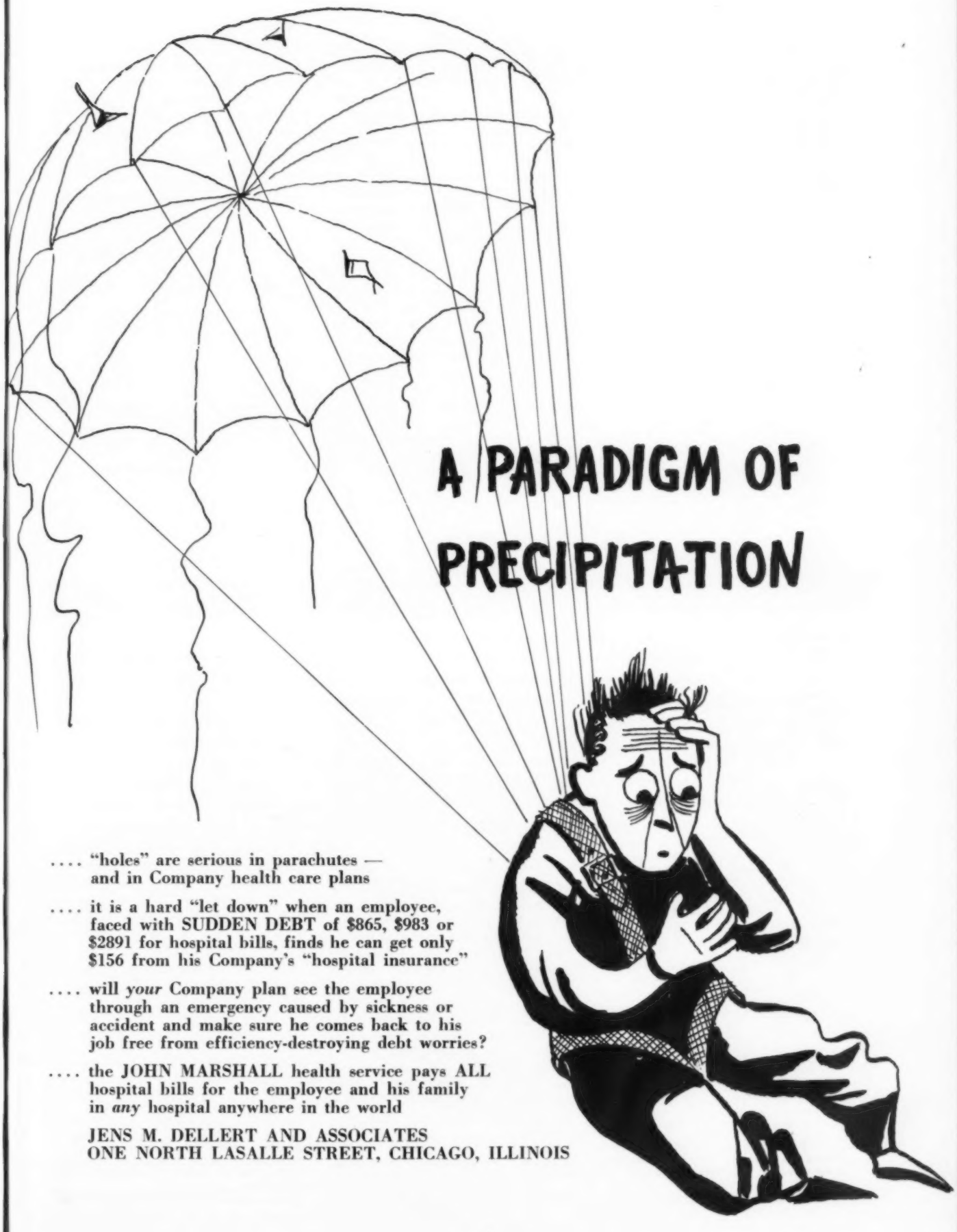

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AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, and while in Baltimore he was on the staff and faculty of the Maryland General Hospital.

JAMES STEVENS SIMMONS, M.D., was recently appointed to membership on the Armed Forces Medical Advisory Committee, which is composed of outstanding professional men in medicine and dentistry. It serves as an advisory body to the Secretary of Defense and consults with Dr. Richard L. Meiling, Director of Medical Services for the Department of Defense, on policies affecting the medical services of the three military departments. DR. SIMMONS, who retired from the Army with the rank of Brigadier General in 1946, is Dean and Professor of the Harvard School of Public Health, Cambridge, Massachusetts, and an international authority on preventive medicine and public health. He has held prominent posts with the Army in this specialty, both in this country and at foreign stations. In addition to his degree in medicine, he holds the degree of Doctor of Public Health and has been awarded the honorary degree of Doctor of Science by four universities.

EVERETT W. PROBST, M.D., who has been temporarily in Richland, Washington, on industrial medical problems connected with atomic energy, will be located permanently as Medical Director of the National Aniline Division of the Allied Chemical and Dye Corporation, 1051 South Park Avenue, Buffalo, 10, New York, after October 1, 1950.

THE NEW YORK Society of Industrial Medicine is holding its 16th Annual Dinner and Scientific Meeting at the Hotel Statler, 33rd Street and 7th Avenue, New York City, New York, on October 5, 1950. DONALD COVALT, M.D., will be the principal speaker. DR. COVALT is Clinical Director, New York University, and Bellevue Medical Center Institute of Physical Medicine and Rehabilitation. His subject will be "Prosthetic Service for the Industrial Injured." The Welfare Council of New York City is a joint participant in the meeting.

EIGHT PROMINENT industrial physicians will lecture at the Post-graduate Course in Diseases

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References: 1. Management of the Common Cold with Neohetramine. Ind. Med. & Surg. 19:39-41 (Jan.) 1950. 2. Cost of the Common Cold: Met. Life Ins. Co. Stat. Bull. 28:6 (Nov.) 1947.

The Industrial Package contains a roll of 500 RESISTABS individually sealed for easy clinical dispensing. This package is available on direct order through our Professional Department. The cost is only $4.25 for a package containing 500 RESISTABS.

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63rd Annual Meeting, April 3-5, 1951, at the Drake Hotel, Chicago

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of the Chest, sponsored by the Council on Postgraduate Medical Education and the New York State Chapter of the American College of Chest Physicians in New York City, November 13-18, 1950. ANTHONY J. LANZA, M.D., Director of the Institute of Industrial Medicine of the New York University-Bellevue Medical Center, will be the Moderator at the Industrial Pulmonary Diseases section, and will present a lecture entitled, "The Pneumoconioses, Silicosis, Asbestosis, Diatomaceous Earth and Shaver's Disease, Clinical Aspects." Other lecturers and lectures will be HARRY E. TEBROCK, M.D., Medical Director, Sylvania Corporation—"Recent Advance of the Management of Chronic Beryllosis"; LEONARD GREENBERG, M.D., Director, Division of Industrial Hygiene and Safety Standards of the State of New York—"Pulmonary Effects of Toxic and Noxious Vapors and Gases"; FRANK R. FERLAINO, M.D., Assistant Clinical Professor of Industrial Medicine, New York University—Bellevue Medical Center and Medical Director, New York Executive Offices, General Motors Corporation—"Hazards and Control of Dust in Industry"; WILLARD MACHLE, M.D., Industrial Medical Consultant—"Lung Cancer in Industry"; ARTHUR VORWALD, M.D., Director of Saranac Lake Laboratories — "Pathology Correlated with X-Ray Manifestations in Pneumoconiosis."

JOHN HENDERSON, M.D., the company's medical director, reports that the Johnson & Johnson First Aid Station at the Chicago Fair of 1950 was awarded the Certificate of Approval of the American College of Surgeons.

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American Conference of Governmental Industrial Hygienists, U. S. Public Health Service, Washington, D. C. J. J. BLOOMFIELD, Secy-Treas. April 22-24, 1951, Atlantic City

American Industrial Hygiene Association 4400 Fifth Ave., Pittsburgh 13, Pa HENRY F. SMYTH, JR., Executive Secy. April 23-26, 1951, Atlantic City.

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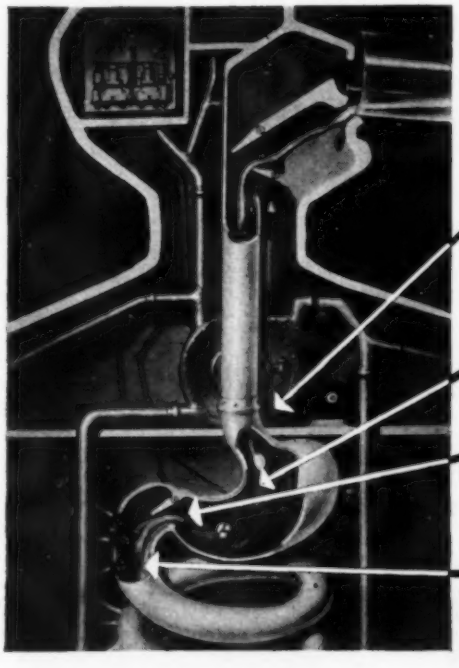
Minor ailments can mean major production losses

BUFFERIN works fast to keep your workers working



1. BUFFERIN enters the stomach here.

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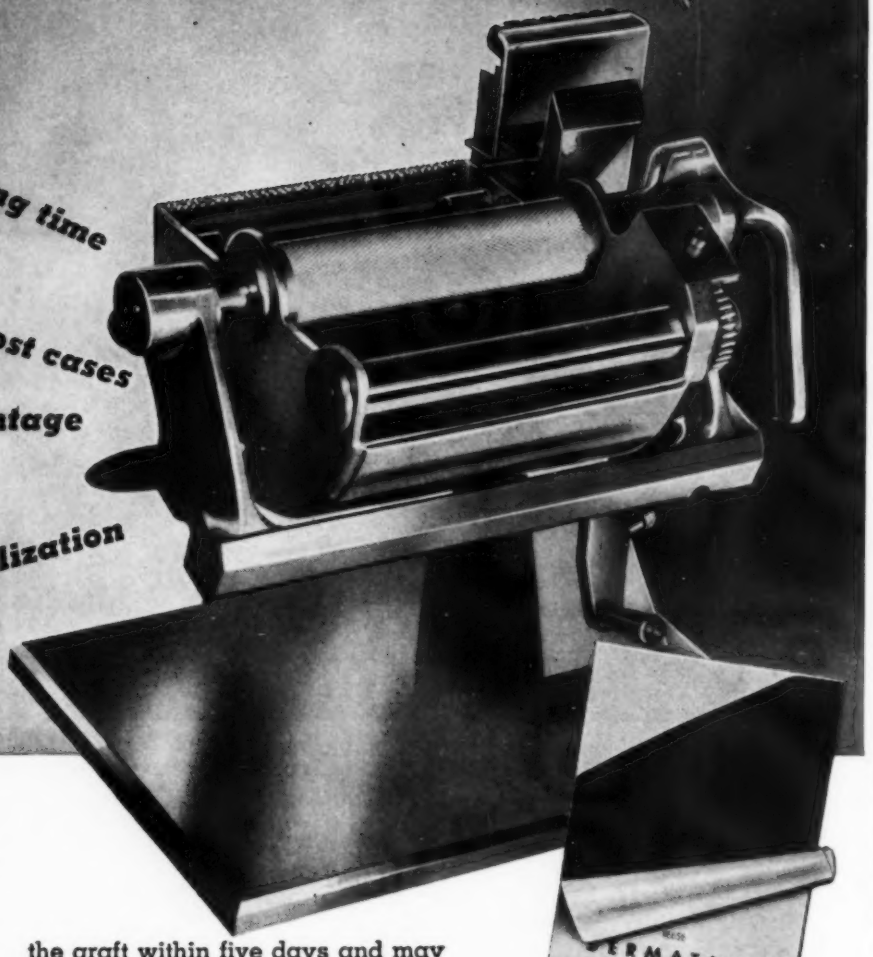

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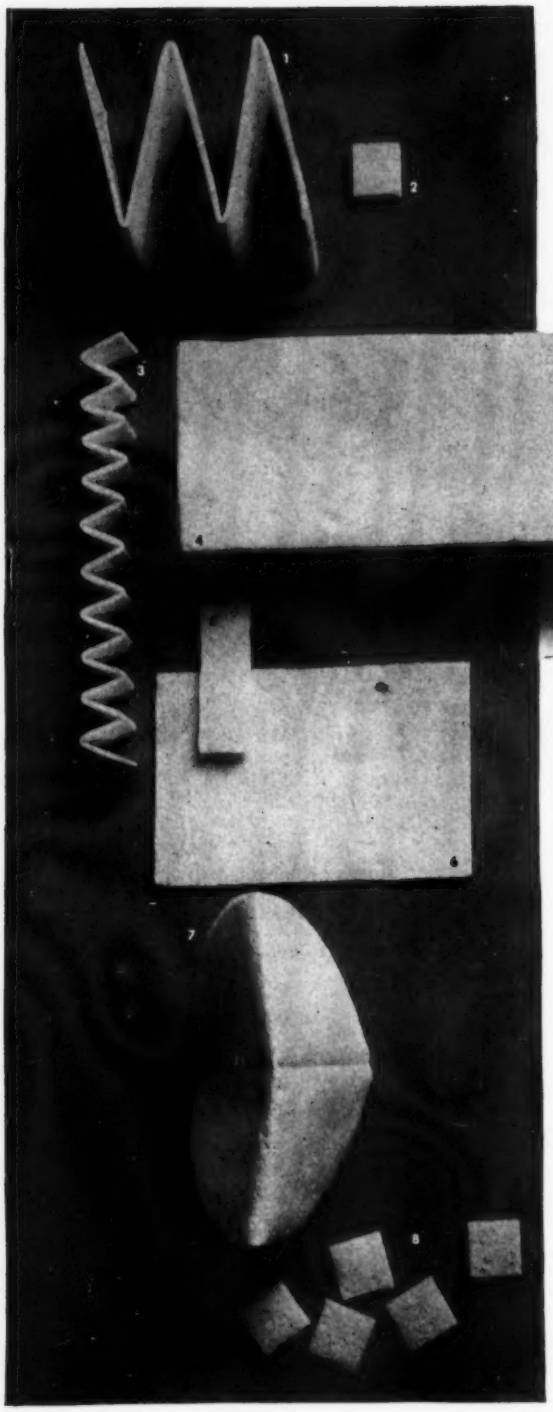

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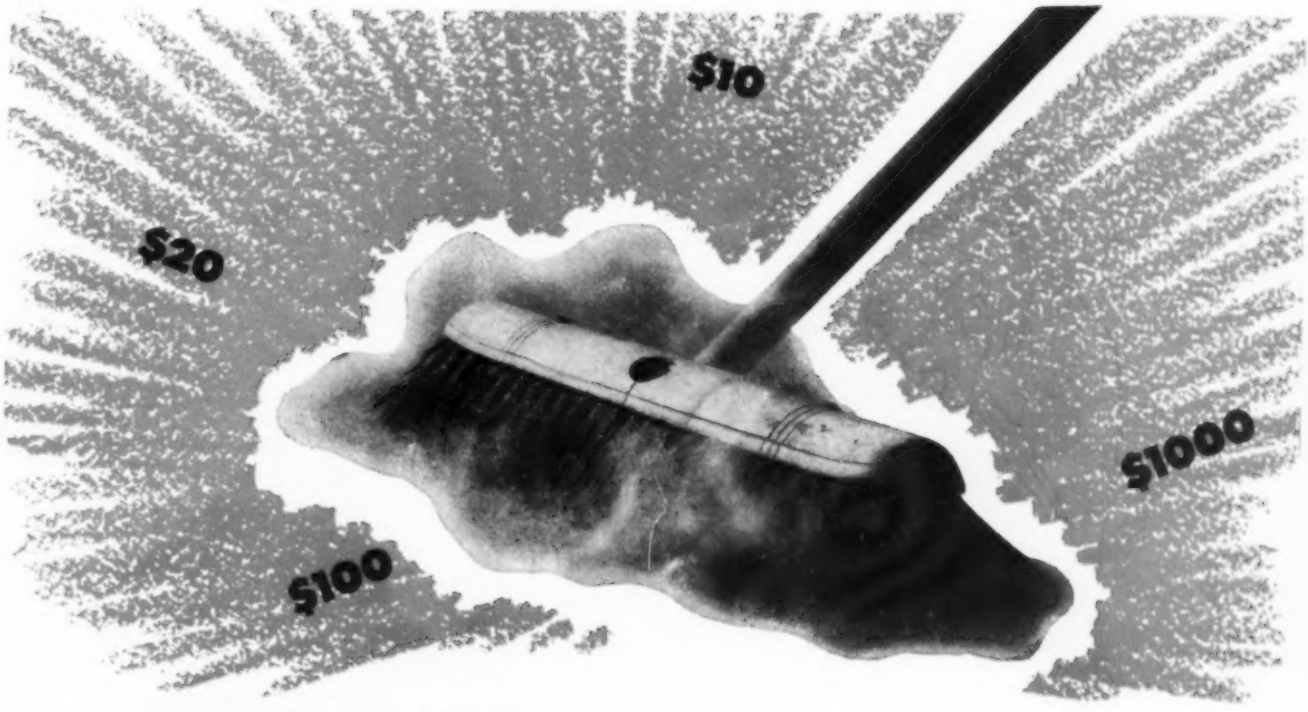

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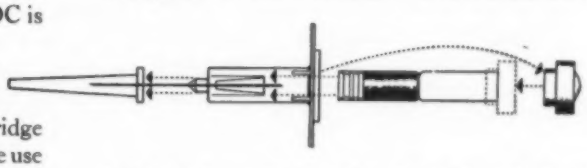

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*Wilbur, D. L.: Principles in the Use of Vitamins in Treatment: I. Vitamin Deficiency Diseases. Gastroenterology, 1:179, Feb., 1943.

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HAND AND RESTORATIVE SURGERY

Common Hand Injuries

FRANK W. BARDEN, M.D.,
Medical Director, Saco-Lowell Shops,
Biddeford, Maine

THE TEXTILE machine industry, one of the oldest manufacturing processes in the United States, is a heavy industry, with all the hazards that are connected with a foundry, machine shop, material handling, tooling, sub-assembly, final assembly work, and transportation. As a result, we are subjected to a variety of accidents—many minor, some quite serious.

During 1949, with an average plant population of 4000, we found that 47% of all our 7,356 accidents resulted in injuries to the hands or wrist. Many of these required extensive repair in order to get, as an end result, some semblance of function. Over 99% of these types of injuries resulted in no functional loss, but many of the group did result in varying degrees of psychological impairment. I am sure that many of you who are doing industrial work will, upon investigation, find figures similar to these in your own plant. Maybe not as high, but considerably higher than you estimated. The only type of injury that exceeded the 47% was the eye injuries which were 1% higher. This leaves only 5% of the total injuries occurring to be accounted for by hernias, back cases, foot injuries, and all others. During this same period hand injuries accounted for 7,970 man hours of lost time. This figure was arrived at by taking the lost days times eight hours plus time lost in the dispensary for treatment, and travel time lost to and from the job. From all past experiences, as reported by a number of authorities, we know that for every tangible dollar of cost there are three dollars of hidden costs to accidents. In our own case, at a base pay of $1.23 per hour plus $3.00 (for each dollar of known expense) the cost in hand injuries alone was $83,344.68. In many states this estimate for the same experience would be considerably higher because of differences in compensation paid, medical costs, etc., relating to the accident. All these figures do not project the pain, anxiety, loss of earning power and permanent psychological damage to the injured employee.

For years, special emphasis has been placed upon eye injuries and their proper care in industrial plants. I would like to emphasize the fact that hand injuries should receive the same highlighting in industry as eye protection and eye care programs. In many industries, where eye protection is mandatory, the percentage of eye accidents is low. If hand injuries were compared to eye cases in their incidences I believe the hand injuries might greatly outnumber the eye injuries. In many situations eyes can be protected much better and more easily than hands. However, working with the various departments on safety protection, it is surprising how much hand protection can be given in many of the cases. It is part of the industrial physician's job to see that management is made aware of unsafe practices and that, where possible, these bad conditions are corrected. It is only by reducing the incidence of exposure that a reduction in accidents (in this case maimed hands) can be effected.

For the purpose of simplicity, I would like to divide my discussion of common hand injuries into three parts: (1) Accident Prevention. (2) General Principles of Treatment. (3) Rehabilitation.

Accident Prevention

BEING extremely interested in the cause and prevention of accidents we set out, over 18 months ago, to make a detailed study of all accidents occurring in the plant. Upon investigation of their causes, we found that 85% could have been avoided. These were due to the human element, ranging from pure carelessness to horseplay, fatigue, family troubles, illness, either of the employee or in the family, supervisory incapabilities, or just plain mental incapacities. Poor selection of the person for the job, in many cases, may be due to an aftermath of the last war. Selective placement could not be practiced universally when calling upon manpower to staff industrial concerns to do war-time work.

Presented at the Section Meeting on Hand and Restorative Surgery at the Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, April 25, 1950.

As a result, many people were placed on jobs they were not capable of performing at any time and now, under competitive standards, they are not able to hold up their part of a specific job and are at an extreme disadvantage. We have examples of men, rejected by the Army because of mental incapacities, coming to work for us, accumulating their seniorities and now well entrenched in their jobs. However, we see them almost daily in the dispensary for this or that accident. Should we call these men accident-prone? Or are they just badly placed? These people have accumulated enough seniority so that, when changes are being effected, they cannot be eliminated, and transferring to types of work that they could do satisfactorily is not possible. New employees are now being selected, but it will be some time before these errors of placement can be eliminated.

The remaining 15% were found to be due to failure of machines, poor design of operation, poor lighting and various other physical factors within the individual department.

Part of our investigation included taking pictures of the places where the accidents happened. If a machine had been involved it was stopped and nothing touched until the photographer could get a number of pictures. In most cases the injuries were photographed soon after the accident (when permissible) and follow-up pictures were taken. These have been used at the various meetings of supervisors, management, etc., to impress upon them how accidents occur, and the extent of the injuries, and what the end results are.

General Principles of Treatment

TREATMENT of Hand Injuries. Basically, we are attempting to follow the recommendations of the American College of Surgeons in regard to hand injuries. We undoubtedly have a few minor variations, but these are necessary because of existing conditions.

In industry, where there is more or less control of the early treatment of injuries, it should be possible for all immediate care to be given within the period referred to by Dr. John Moorhead, in his book "Clinical Traumatic Surgery," as the "Golden Period"—or within the first six hours post-trauma. Our own experience coincides with the opinion of many others that the proper immediate care will decrease the incidence of infection, shorten the period of convalescence, and decrease the severity of the disability.

All injuries, no matter how trivial, are considered contaminated wounds and so plenty of soap and water is employed to cleanse the area. Normal saline is used copiously to irrigate the wound. After external cleansing, a sterile dressing is applied. The patient is then seen by the physician. The wound is examined for deep tissue injury; motion is noted (tested against resistance) for possible tendon and nerve injury, and then an x-ray film is taken. Further treatment is determined on the basis of whether there are fractures present, tendons cut, or deep tissues involved.

Minor lacerations, if not deep, can often be approximated by the use of adhesive tape butterflies. However, when it is evident that the wound needs suturing, this is done. One thing we never do is use skin clips around the hand. Fine Dermalon or silk sutures on atraumatic needles are used, with interrupting suturing. Our experience reveals that the skin of the hand should be treated the same as that of the face. The less the trauma by suture material and by needles, the less scar tissue formation. I have seen many cases where, three or four months after injury, one could barely identify the scar of the injury. Previous to our paying so much attention to the suture material used, I would occasionally see some fairly unsatisfactory results, and with all our precautions we still get some. We apply local antiseptics to the edges of the skin, but do not put any antiseptics into the wound. This entire procedure is done in the plant operating room under aseptic technic. Before closure we often place a layer of sulfanilamide over the raw area. This is just dusted on—not the entire wound filled with the powder.

If, upon examination, deep tissue, tendons, etc., are involved, the patient is hospitalized and the necessary repair work is done in the surgery —not the emergency room. Under intravenous anesthesia, with a tourniquet for the control of bleeding, the wound is debrided of only those tissues that we feel would result in infection or unsatisfactory healing. Preservation of all the viable tissue possible is attempted. Repair of tendons, nerves, bone, etc., is done, and the wound closed. Petrolatum dressings (as the first dressing or at the most the second) are applied. Large protective dressings are used and the hand kept in the position of function or position of grasp. If necessary, splinting is used. Wrist is hyperextended in cock-up position; fingers in mid-flexion and separated; thumb abducted and in mid-flexion with tip pointed toward fifth finger. First dressings are not removed for at least one week unless infection sets in. In our experience all cases have resulted in primary union with no infection. We have had to do some secondary repair of a tendon, but they were all clean cases. The patient is given tetanus prophylaxis and penicillin (Depot) is started—400,000 units the first day (this dose contains 100,000 units of crystalline potassium penicillin G and 300,000 units of crystalline procaine penicillin G), then subsequent daily doses of 300,000 units of crystalline procaine penicillin G are given for the succeeding six days. Usually the patient is out of the hospital within 48 hours and treatment is continued by daily visits to the plant hospital. Of course, if the injuries are more extensive, these time limits are not applicable.

Puncture wounds of the hands are given the same over-all treatment as minor lacerations. Tetanus prophylaxis is used in all cases after

a test dose for sensitization has been given. If there is allergy to the tetanus antitoxin, divided doses are given. Occasionally, we have some reaction seven to eight days later, but these have easily been controlled by antihistaminic drugs given orally. We have also found that some anti-tetanus serums made by some manufacturers tend to produce more reactions than others.

Foreign bodies, such as particles of steel, wood, glass, etc., are removed immediately if possible. If a particle is small and deeply embedded, we do not go digging for it. The wound is given the same attention as any other wound of the hand and antibiotics are used to combat infection. Some of the foreign bodies can be localized by x-ray—others cannot. Tissue reactions often wall off these particles so that within a short time a local nodule may be felt. At this time removal can be attempted and often is quite simple. If there is no discomfort, loss of motion, etc., from the foreign bodies being present, we advise non-removal until there are some indications for doing it. Particles of wood may break off from a large piece when it is removed, and these small particles will set up a foreign body reaction with some localized infection. When this has been well localized the area is opened, and most of the time these small particles will come out along with the drainage and promptly go on to healing. Often hot soaks and wet dressings are used as treatment of suppuration. This is true also of puncture wounds. Indications for the use of sulfonamides or antibiotics are always watched for. If, however, this area does not heal and continues to drain or heal over and then reopen in a few days you can be sure that the foreign body is still present, and measures must be taken to eliminate the trouble.

Injuries to the nails are often very painful. A crushing blow to the finger is the most common cause. Hematomas of varying size result, and x-rays often reveal a fracture through the tuft of the distal phalanx. We do not drill the nail to relieve pressure, and we try to discourage people from going home after work and drilling their own nails. Hot soaks and wet dressings are used. If the hematoma is large enough to elevate the nail we push back the cuticle at the base. This will allow the blood to be evacuated and will not seal over as a drill wound would do. We do not pull off nails regardless of the extent of injury. Loose parts of the nail are cut away but any part that is still tight to the bed is allowed to remain. Within a few days these particles loosen up and can be picked off painlessly. Through years of following this routine I can only remember two or three cases of infected fingers, and all of these resulted from having had the nail drilled to relieve the pressure.

Burns of the hands result from many causes. Thermal burns are frequent and are often the result of grinding wheel accidents or burns due to hot metal. It is quite common that burns from hot metal or electrical current do not show the true extent of damage until a few days later. What may appear to be not too deep a burn at the time of accident, within 48 hours exhibits signs that deeper structures are involved. Burns from grinding wheels, if deep, in our experience are very slow at healing. Often, the edges become thickened and the area takes on the appearance of an ulcer. Scarifying the edges with a scalpel is usually enough to stimulate skin proliferation. Chemical burns are quite frequent and are treated the same as other burns.

A common type of burn that we see is caused by book matches. An employee may be attempting to light a cigarette while running his machine. The book of matches he is holding catches fire and before he drops it he receives a good burn on the thumb, index finger and palm of the hand in the region of the thumb and index finger. Extensive burns should receive immediate attention. We use a mild bland ointment on gauze, and then apply plenty of sterile "waste" and bandage snugly. If a large area is involved the patient is immediately hospitalized and all the routine care given. The small burns that are seen in the dispensary daily are treated the following way. If there is blister formation do not open the blister—apply sterile vaseline gauze and bandage snugly. When the blisters are opened they are opened widely and the old skin is removed. We have found that excellent results have been obtained after about the third or fourth day by using chloresium ointment. This tends to keep the wound clean and healthy looking and seems to stimulate skin proliferation.

Traumatic amputation of the fingers at various levels occurs quite frequently and, according to our survey, all resulted from the failure of the machine operator to follow prescribed safety rules. In all cases we attempt to save every bit of viable tissue—sometimes not completely covering the tip with good skin. However, these have done remarkably well. No skin grafting has been necessary, and healing has not been prolonged. Sacrificing some of a finger just to make a beautiful skin flap is not encouraged.

Infections of the hand are not as common now as formerly. Undoubtedly the early care and the use of sulfonamides and antibiotics have cut down the incidence considerably. The only ones that we do see are the neglected cases—the result of late reporting of the accident or not coming in until the infection is well on its way. Hot soaks, wet dressings and antibiotic medications are used routinely under this regime. Many cases that looked as though they were going to develop into deep abscesses requiring drainage clear up without surgical intervention. Those needing surgical drainage do not run the long protracted course with the resulting disability that we got before we had the newer drugs at hand.

In dealing with any injury to the hand we must constantly think about the general condition of the patient. Diabetics who are uncontrolled will not do well. Delayed healing is

one of the important signs. Undiscovered syphilis will cause numerous unlooked for sequellae. Various dermatological conditions may be stirred up by trauma, and many primary lesions of the hand may be caused by association with harmful material resulting in an occupational dermatitis.

Routine x-rays also reveal underlying bone pathology which might not be suspected if this procedure were not followed.

Rehabilitation

REHABILITATION of hand injuries should begin as soon as the accident has occurred. Proper treatment will help keep the disability to a minimum. Often just a chance remark to the injured employee at the time of accident may have a bearing on his future disability and rehabilitation. If splinting is required, only that which is absolutely necessary should be used—keeping the rest of the hand mobile. Passive motion is started as soon as it is safe to do so and, as soon as possible, hydrotherapy with whirpool bath is begun. Exercise of the fingers is encouraged by having the patient work with varying-sized rubber balls while receiving the whirlpool. Massage is used considerably. Other exercises are also employed to increase finger motion gradually—from gross movement to fine movement. We advocate the use of knitting, crocheting, etc., to facilitate fine finger motion.

We attempt to get the man back on the job as soon as possible and encourage him to exercise his hand. Many times we are confronted by objections from the foreman and even the union because they do not want a man who can do only half a job. Too much opposition would, of course, necessitate keeping the man off until he could do a more efficient job. Our orthopedic consultants feel, as we do, that it is better to get the man back on half work than to let him "loaf" until he is completely well. Too often this requires almost superhuman effort before we can finally get such men back to work, and even then they often want to do only certain types of work, claiming they are unable to carry on their old jobs. Those who obviously cannot perform all of their old duties are transferred to other jobs, and those who can do their old jobs are sent back to them.

An attempt is being made to have a department set up for small assembly work. This would be used to get people back earlier than we are doing now and encourage them to want to work. The present trend of too much welfare is very evident with many people. If we can get them back to do something, then much will be gained, and the patient will be making a start along the "roughing up" process which we feel is necessary to rehabilitate many of our injuries. It is far too early to say just what the result of this attempt is going to be.

Summary

TO SUMMARIZE, I would like to re-emphasize a few of my statements.

1. Hand injuries are more prevalent than suspected.
2. Hand injuries should be given the same "highlighting" in an industrial program as injuries to the eyes.
3. Selective placement of employees will decrease hand accidents.
4. Proper immediate treatment of all hand injuries is essential. (Try to give treatment during the "golden period," which is six hours post-trauma.)
5. All wounds of the hand should be considered contaminated at the time of injury.
6. Rehabilitation of hand injuries should begin as soon as the accident has occurred.
7. Attempt to get the injured employee back on the job as soon as possible.

Vanadium Pentoxide Poisoning

S. G. SJOBERG, Falun, Sweden, in *Sartryck ur Nordisk Medicin* (41:1500, 1949), gives an account of the circumstances that led to the present investigation on vanadium pentoxide poisoning, carried out under the auspices of the Department of Industrial Hygiene of the State Institute for Public Health (Prof. Sven Forssman) and the Medical Clinic of Falu Hospital (Dr. Arthur Engel). The discovery of the element vanadium, its properties and importance in industry, are discussed. There is also a brief review of the previous scanty literature on vanadium pentoxide poisoning. The author describes the syndrome presented by his own series, the nucleus of which consists of 36 persons whom he studied closely during the past two years. In its most pronounced form the syndrome has been as follows: sore throat, distressing cough with viscid or no sputum, rhonchi, shortness of breath on exertion, palpitation, weakness and disability. Different forms of pneumonia have been diagnosed in a few cases. Eczema has also been present. The main objective symptoms have been redness or vascular injection of pharynx and larynx, possibly rhonchi, and a certain degree of eosinophilia in the blood. Only in those cases in which pneumonia was present has radiography shown changes in the lungs. In a remarkably large number of cases Schlesinger's test for urobilin has been positive; otherwise no pathologic conditions have been observed. It is concluded that the conditions described are to be regarded as an industrial disease caused by vanadium pentoxide dust.

Reconstructive Surgery of the Hand and Industrial Rehabilitation

MICHAEL L. LEWIN, M.D., F.A.C.S.,
New York City

OWING to its constant utilization and exposure, the hand is more frequently involved in injuries than other parts of the body. The emphasis on proper first aid has been responsible for the speedy recovery of many minor injuries and the avoidance of many complications, and antibiotics have been helpful in checking infections. There are other injuries, however, which, by their nature, will result in some degree of permanent disability. It is primarily this group which constitutes the subject of this article.

As a result of the experience in Army Hand Centers, there has been a growing realization in civilian practice of the need for concentration of hand injuries in specialized clinics. However, in actual practice the distribution of hand cases is diffuse. Despite a steady educational campaign, not infrequently one still encounters the attitude that their care belongs in the field of minor surgery. In some instances the need for secondary repair is not recognized. After the wound is healed, the patient is discharged with no attempt being made to initiate the rehabilitative phase of treatment. Nor is it unusual to find physicians who question the justification for prolonged effort in restoring or improving the function of a hand. Early amputation of the hand or a part of it has sometimes been recommended to hasten treatment and restore the patient to employment more speedily, only to find that it irrevocably and permanently increases the final disability.

THE HAND is a complex organ with many vital structures crowded into a small space. Because of the inter-relationship among the structures, the stages of rehabilitation must be spaced at adequate intervals. Satisfactory skin must be substituted before a tendon can be grafted. Finger joints must be mobilized before any tendon surgery can be contemplated. Each step of anatomical repair must be followed by functional restoration. It may take several months until a grafted tendon or a sutured nerve has re-established its function.

Because the treatment of extensive hand injuries is time-consuming, requiring multiple stages of surgery, rehabilitation is costly. The interpretation of the injury in dollars and cents does not always favor the maximum rehabilitation. While most of the insurance carriers have taken a highly responsible attitude in this respect, others are reluctant to support an extensive program for rehabilitation and may encourage early financial settlement which the patient may be willing to accept at the moment but comes to regret later.

The rehabilitation of an injured hand is based on conservative surgery, with purposeful planning and integration of all aspects of treatment (splinting, exercises, physiotherapy, etc.). Surgical effort is directed toward the preservation of any part of the hand which is capable of preservation, and toward developing the maximum functional utilization of the remaining parts. Conservatism in hand surgery is particularly justified when the inadequacy of prosthetic restoration is contemplated. The prosthesis can substitute for only a minute part of all the numerous and involved functions. Its inadequacy is pointed up by the fact that so few hand amputees use it. Sir Frederick Wood Jones has said, "To be able to grasp with some remnant of a thumb against some remnant of finger is a triumph of conservative surgery, besides which neatly performed amputations are ranged as splendid failures."

An important phase of rehabilitation is helping the patient adapt himself to the changed architecture of the hand, and to develop compensatory mechanisms. The surgeon must secure the patient's active participation throughout treatment in order to guide him into constructive self-helping activity. It is amazing and gratifying to see how well patients can compensate for defects of the hand. A patient with a hand disability rated as 70% could do everything required of him as a skilled textile worker and could continue in any of his usual domestic activities. There was little that a normal bi-manual person could do that he could not do. His handicap will become significant, however, should he want to compete for new employment. Few employers have had experience with the handicapped worker, and thus few are aware of the extent to which he is able to compensate for his disability. Most of them, therefore, are inclined to be resistive to hiring a handicapped worker, particularly one with a hand injury.

To illustrate the management of hand injuries and some of the problems encountered in their rehabilitation in civilian practice, a group of cases has been chosen with tegumental losses of varying degrees. In many the damage of the deep structures, tendons, joints, and bone is to be found in combination with tegumental losses. They are divided into four categories, depending upon the site of the injury.

Injuries of Fingers

INJURIES of the fingertips are common and deserve more attention than they often receive. Scarring on the fingertips may be quite disabling,

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not only because it interferes with sensation but also because the tips may be tender and painful on touch, particularly when the soft tissue pad is lost.

In a traumatic amputation of the soft tissue pad on the tip of the finger an immediate or late application of a free skin graft will speed up the healing and eliminate the objectionable scarring. Should it be necessary to replace some soft tissue and the scarring be limited to a small area, a composite graft from the ear lobe may supply the needed soft tissue padding. Such small grafts take amazingly well and offer a simple and rapid procedure for eliminating an annoying condition. More extensive losses of the tip and volar surfaces of the finger with exposure of tendon and bone call for an abdominal flap which supplies both skin and soft tissue padding.

Deep scarring on the volar surface of the finger can often be replaced by local tissues, using a rotation flap from the lateral surface of the finger. This provides excellent skin for that part of the hand which receives the hardest wear. It covers the tendon and places the free skin graft in relatively protected areas on the side of the finger.

Injuries to the Dorsum of the Hand

THE dorsum of the hand is frequently involved in burns. The majority of heat burns involve only the tegumental layer and so require only prompt and adequate resurfacing with free skin grafts. Deep burns on the dorsum of the finger may destroy the dorsal aponeurosis and the interphalangeal joints. These joints then remain ankylotic and the function of the hand is best served if they are allowed to ankylose in a functional position.

One of the most severe hand injuries encountered in industry is the so-called friction burn, resulting from hot roller press accidents. The damage includes not only the soft tissues, the tendons, and the periarticular apparatus but also the cortex of the bone. Unlike soft tissues, the devitalized bone is slow to demarcate from viable bone. Early and active attempts to effect the separation surgically are often not practicable because they may spread the damage.

It is usually the primary and secondary involvement of joints which is responsible for the major share of final disability. In these cases the reparative treatment consists of restitution of skin, subcutaneous tissue and tendons. If some joints cannot be made to function again, arthrodesis in a functional position is indicated.

CASE REPORT 1: The patient was injured when his right hand was pulled between hot roller presses. His early treatment consisted of protective dressings and administration of antibiotics. When first seen, four weeks after the injury, the entire dorsum of the hand and forearm was covered with a heavy, thick, necrotic crust. The volar surface of the forearm and hand

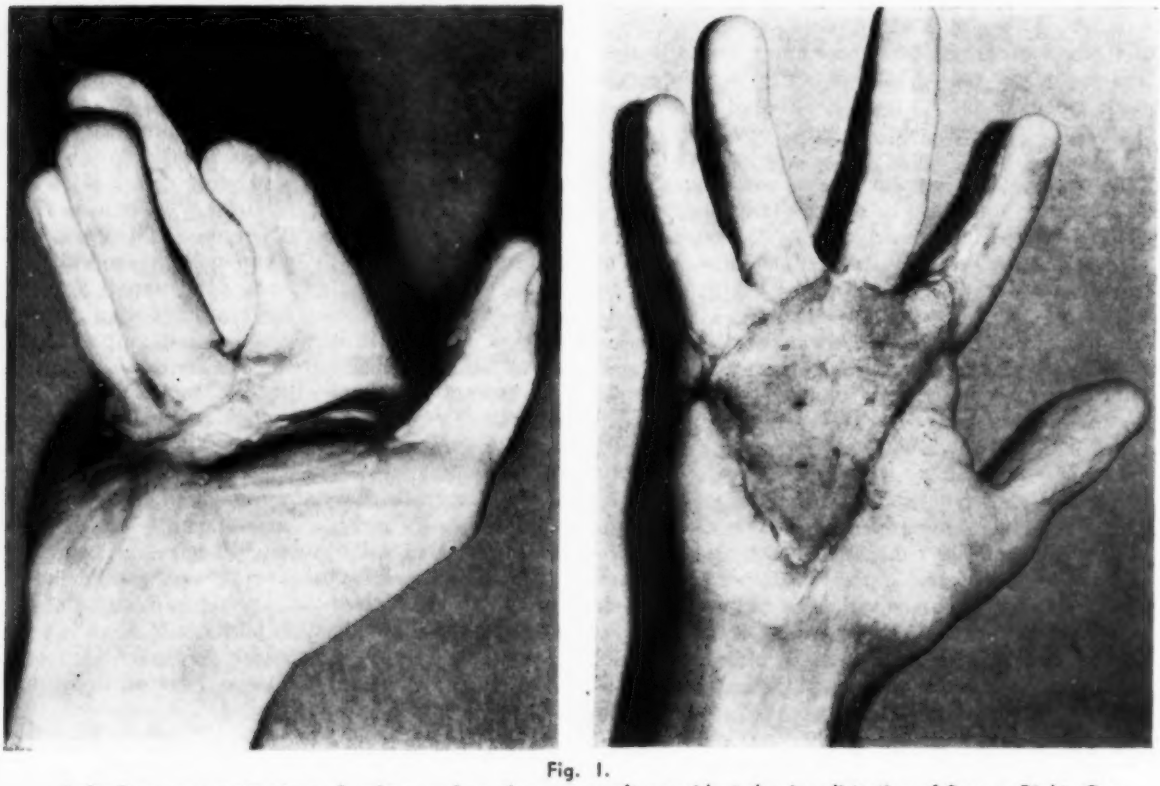

Fig. 1.

Left: Burn scar contracture of palmar surface three years after accident showing distortion of fingers. Right: Corrected by excision of scar and free skin graft. As a result of long standing deformity there was a subluxation of extensor tendon (into groove between the knuckles). This was corrected subsequently with restoration of full extension

Fig. 2-a.
Case 1. Three and a half months after injury, denuded phalanges, metacarpals, and islands of granulations protruding through drill holes may be noted. Dorsum of hand and forearm covered with temporary skin graft

presented a weeping, inflammatory area, not unlike a deep second degree burn.

The wound was debrided and it was found that there was a loss of all soft tissues over the hand and distal forearm. The phalanges and metacarpals of three ulnar fingers, part of the carpus and the distal three inches of the ulna were denuded and discolored. The corresponding joints, including the wrist joints, were widely opened. After a few days of preparation, the entire wound was covered with about 80 square inches of temporary split graft. An attempt was made to close the joints by suture and to remove the necrotic bone layer without devitalizing the involved bone. However, this was not successful because the entire cortex and the articular cartilages were necrotic. The skin grafting, however, eliminated about four-fifths of the open wound. The hand was placed in a functional position and enclosed with plaster.

The patient was re-admitted to the hospital after one month. The joints were found closed and the denuded bones well anchored in gran-

Fig. 2-b.
Thoraco-abdominal tubed flap is replacing temporary graft

Fig. 2-c.
After completion of resurfacing and tendon transfer. Note pinching mechanism and absence of little finger and its metacarpal

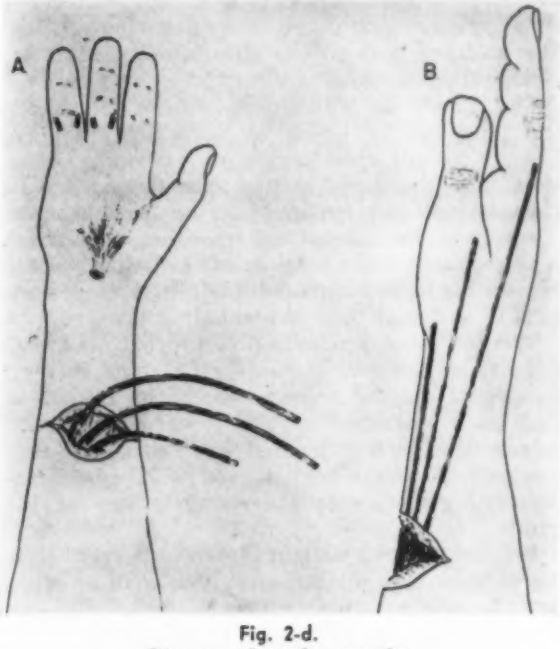

Fig. 2-d.
Diagram of tendon transfer

ulations. Perforations were drilled through the cortex and the hand again enclosed in plaster. After a month large islands of granulation were found emerging through the drill holes. The cortex between the islands was removed and the remaining wound was skin grafted. The little finger, which was most severely damaged, was amputated, together with its metacarpal, and the volar skin was utilized for resurfacing of the dorsum. Three and a half months after the debridement, the entire wound was covered with a skin graft (except for exposure of about two inches of the ulna). Passive exercises were instituted as soon as the edema of the fingers subsided.

This completed the treatment of the acute injury and the rehabilitative phase could be started.

It was obvious that the patient required a flap with soft tissue padding to protect and revascularize the damaged bone and to make possible the restoration of the extensor mechanism, at least for the two most salvageable digits, the thumb and the index finger.

Over a period of four months, a 15 x 6 inch thoraco-abdominal skin tube was transferred to the arm. During one of the stages the exposed distal end of the ulna was excised. The resurfacing required five stages with hospitalization ranging from two to 14 days.

About one year after the injury, the patient returned to work. Six months later he was admitted to the hospital again for revision of the flap. This included defatting of the portion around the wrist and the hand and the addition of free grafts around the fingers.

Two years after the injury, a tendon transfer was performed. The sublimus flexor tendons of the ring and middle fingers were pulled out in mid-forearm and brought over the dorsum to serve as extensors of the index and ring fingers. The palmaris longus was attached to the stump of the abductor longus.

The patient has a functional unit of the thumb and index finger which he uses for grasping. The middle and ring fingers are ankylotic at the metacarpo-phalangeal joints. The fingers are in a functional position and can be brought near the thumb. He has normal sensation. The wrist is almost ankylotic. In spite of these limitations, he uses his hand on his old job, performing work usually assigned to a bi-manual worker.

The carrier was reluctant to support his treatment from the very beginning. He had secured an opinion at the commencement of treatment that an amputation of the forearm was indicated. The carrier pointed out repeatedly that the patient would be assigned a schedule corresponding closely to the complete loss of the hand.

We feel that the patient has an infinitely better result than an amputation stump, with or without the best prosthesis. The hand can probably be improved further by an arthroplasty of the middle and ring finger joints.

Injuries to the Palm of the Hand

IN SPITE of the functional demands on the skin of the palm of the hand, if the underlying soft tissues are intact, free skin grafts of full thickness or thick split variety are satisfactory and remain stable with reasonable precautions. However, should the content of the palm be involved and the flexor tendons require mobilization or restitution, skin flaps are mandatory as a preliminary procedure. A judicious amount of subcutaneous tissue in a flap is particularly important because thick, heavy flaps may interfere with the use of the palm.

CASE REPORT II: While working in a fluoroscope repair shop, this patient unknowingly exposed his hand to a machine which was being tested. He believes that the exposure lasted about 15 minutes. Two or three weeks later he began to complain about severe burning on the palm of his hand. A few days later, he noticed that his palm was strawberry red. The skin blistered, became discolored, and developed superficial ulcerations. After a few months of treatment with ointments and soaking, the hand healed. Despite his efforts to protect the injured hand, six months later the palm ulcerated again. He was treated by local applications. When no improvement occurred and the hand became more painful, he was referred for surgical treatment.

The right hand was edematous with signs of inflammatory reaction. The index finger was indurated and exhibited an indolent ulcer on the palmar surface of the proximal phalanx. The deep flexor tendon was exposed. The distal part of the palm showed several superficial ulcerations. Since there was a very slow response to immobilization, elevation, soaks and antibiotics, the deep ulcer was excised and a temporary thin split graft applied. The graft took well and the inflammatory reaction soon subsided.

A split graft in this location was inadequate, unstable and adherent to the tendon, thus limiting its motion. However, it became obvious that the finger was salvageable and required resurfacing with a skin flap under which the tendon could glide.

The involved skin on the distal palm and the index and middle fingers was excised and resurfaced with an abdominal tubed flap. The flap was applied, mitten fashion, over the two fingers and later digitalized, inserting part of the flap into the interdigital space. Full function of the hand was restored.

When examined a year later, it was noted that an area 7 x 7 cm. proximal to the flap presented definite, though mild, changes of radiodermatitis. These changes could not have been detected a year before. The patient was advised to have this area resurfaced without undue delay. In this situation a free skin graft was adequate, and a full thickness free skin graft was applied. The graft has remained stable.

Because of the increasing use of radioactive

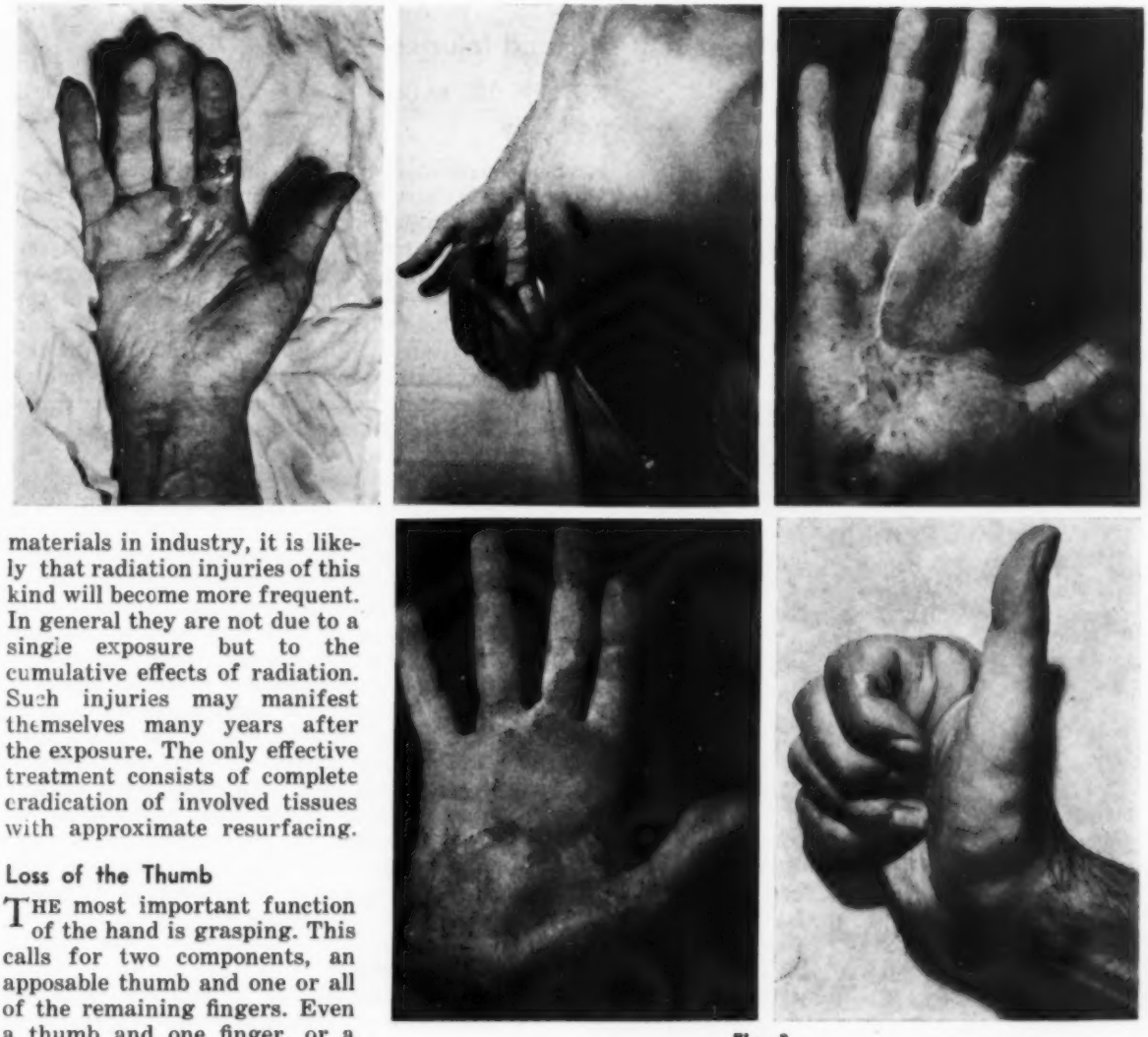

Fig. 3.

Case II. Upper left: Ulcerative radiodermatitis of distal half of palm, index and middle fingers. Exposed flexor tendon over proximal phalanx of index finger. The proximal part of the hand is not involved. Upper middle: After excision of ulcer on index finger and temporary replacement with a small split skin graft. An abdominal skin tube is being used for permanent resurfacing of entire involved area. Upper right: Condition of the hand one year after last operation. Radiodermatitis appears on the palm, proximal to flap. Lower left: After resurfacing of distal palm with free skin graft. No further progress of radiodermatitis in three years. Lower right: Normal tendon function after resurfacing

materials in industry, it is likely that radiation injuries of this kind will become more frequent. In general they are not due to a single exposure but to the cumulative effects of radiation. Such injuries may manifest themselves many years after the exposure. The only effective treatment consists of complete eradication of involved tissues with approximate resurfacing.

Loss of the Thumb

THE most important function of the hand is grasping. This calls for two components, an apposable thumb and one or all of the remaining fingers. Even a thumb and one finger, or a thumb working against the palm of the hand, can represent a relatively satisfactory functional unit. Thus, preservation of any remnant of the thumb is of paramount importance.

Reconstruction of the thumb is particularly justified in bilateral hand deformities. When the metacarpal is present it can be digitalized by creating a skin-lined cleft between the first metacarpal and the index finger, thus forming an equivalent of a short stump of a thumb. When no appreciable part of the metacarpal is present, a functional substitute can be formed, by transportation of the index finger or by utilizing a skin tube in which a bone graft is inserted for stability.

Summary

THE importance of coordinated effort with purposeful planning and conservative surgical approach has been emphasized in the rehabilitation of hand injuries.

The rehabilitation-minded and well-trained surgeon, the persevering patient, and the enlightened attitude of industry and the insurance carrier can all contribute to restoring the patient with a hand injury to his place in industry.

(11 East 68th St.)

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Fig. 3 from the Surgical Service, Halloran Veterans Hospital, Staten Island 2, New York, (treated in cooperation with Dr. Burtram Olmstead, former resident).

Treatment of Hand Injuries

CONDICT W. CUTLER, JR., M.D.,
New York City

IN RECONSTRUCTIVE surgery of the hand, it is well recognized that the nature of the treatment given at the time of the injury, or immediately afterward, determines in large measure the final result. It is our endeavor to obviate, as far as possible, the necessity for formidable reconstructions by the proper management of emergency care.

This policy has led to the adoption of certain principles or objectives in early treatment. They are:

1. Accurate evaluation of the nature and extent of the injury.
2. Prevention of the establishment of infection.
3. Conservation of tissue.
4. Accurate repair of the damage.
5. Adequate protection for the promotion of healing and the early restoration of function.

The purpose of this paper is to illustrate the application of these principles in the more common types of hand injuries.

Burns

WE HAVE become convinced by experience that anything that may further damage the burned surface of the hand should be avoided. Hence we do, at the first dressing, only the most gentle cleansing with soap and water, using soft cotton sponges. Blisters are not opened. Only loose shredded skin is removed. Antiseptics, tanning agents and escharotics are avoided. Fine-mesh vaseline-impregnated gauze is applied to all burned surfaces, the fingers separated by dressing material, the hand placed in the position of function, and a pressure dressing evenly applied to cover the entire hand and fingers. Even pressure is assured by liberal coverage with mechanic's waste, all held in place by a firmly applied elastic knit bandage. The dressing is not removed for at least 10 days, and at that time preparation is made to Thiersch graft any granulating areas.

Both the first and subsequent dressings are to be conducted under strict aseptic precautions, with masking of the operators.

Puncture Wounds

ALL MAJOR puncture wounds should be carefully examined to determine possible injury to tendons, nerves or blood vessels. If deep structures have been damaged, appropriate enlargement of the wound under operating room conditions and in a bloodless field to repair the injury is in order. If gross contamination in the depth of the wound is feared, incision, local debridement and drainage are appropriate. The antibiotics are used systemically rather than depended on for local effect.

In human tooth wounds of the knuckles, the appropriate incision required for the above purposes must extend upward on the dorsum of the hand for about ¾ inch to expose the damaged and infected tissues which have retracted into the dorsal subcutaneous space. In this particular type of contamination, zinc peroxide paste has proved to be beneficial when locally applied.

Foreign Bodies

THE SEARCH for an imbedded foreign body requires exact localization by x-ray, good surface marking, and optimum conditions of anesthesia, asepsis, lighting, assistance and a bloodless field. Even with these aids, the material may not be easy to find and remove. If the foreign body is small and not likely to interfere with function, it may be less injurious to leave it where it is than to attempt removal.

This is certainly not true of foreign bodies which are serious potential sources of infection, such as gun wads, nor of foreign matter introduced into wounds at the time of crushing or lacerating injuries. If not radio-opaque, such foreign material may be readily overlooked unless wound inspection and debridement are painstakingly done.

Lacerated Wounds

IN MAJOR lacerations the principle of accurate evaluation is of first consequence. Injuries to tendons or nerves must be determined by functional testing and direct observation. For the latter, as well as for adequate debridement and the repair of damaged structures, operating room conditions, good anesthesia and a bloodless field are important. The principle of accurate repair obliges the union of severed tendons and nerves. Even the digital nerves are important and their

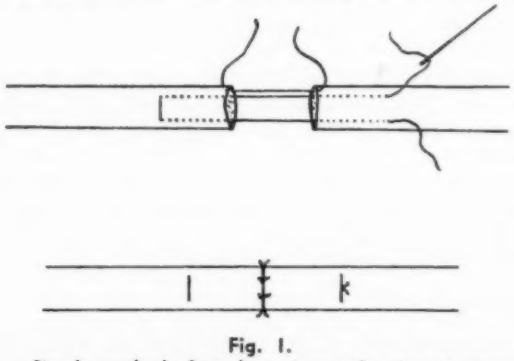

Fig. 1.
Simple method of tendon suture, using two or more mattress sutures and approximating sutures uniting ends. Applicable to extensor tendons

Presented at the Section Meeting on Hand and Restorative Surgery at the Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, April 25, 1950.

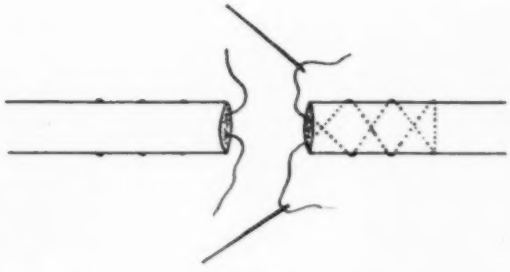

Fig. 2.
Principle of Bunnell's stitch (without pull-out wire) as applied to proximal end of divided tendon. Suture ends run parallel in distal tendon, to be tied at surface of tendon or penetrating skin to be tied over button

repair should not be neglected. Methods and materials for tendon suture offer a wide choice, but the pull-out wire stitch of Bunnell has given us the greatest satisfaction. We have had little success in the results of primarily suturing a divided flexor profundus tendon in the digital canal, and prefer to leave this repair to a later date after securing healing of the sheath and superficial tissues.

For both tendon and nerve injuries protective immobilization by splinting in the position of function is important.

Amputation

INCOMPLETE traumatic amputations of fingers we are inclined to treat on the principle of maximum conservation of tissue. After proper mechanical cleansing of the wound, we employ a fine light superficial suture and splinting only to hold the digit in place, even if bone and both flexor and extensor tendons are severed. We have saved a number of apparently hopeless fingers by this means for subsequent reconstructive surgery and restoration to usefulness.

Complete amputations through the finger are not re-amputated for the purpose of primary closure. Immediate grafting or the employment of one of the local flap graft methods is employed, or the stump is left open and protected until well granulated, when grafts are applied. We feel that the maintenance of maximum finger length is important for function.

Fractures

ON SUSPICION of carpal bone fracture, it is important for diagnosis to have oblique as well as antero-posterior and lateral x-ray views made if injuries are not to be missed. Proper functional position splinting over a 10-to-12 week period has given good results and has almost completely eliminated the need for fragment removal.

In transverse long-bone fractures proper functional positioning of the hand or finger, with splinting, will usually suffice. Flat splinting is avoided here, as in all hand injuries. In oblique fractures, difficult to reduce and maintain, skeletal traction has proven the most useful method.

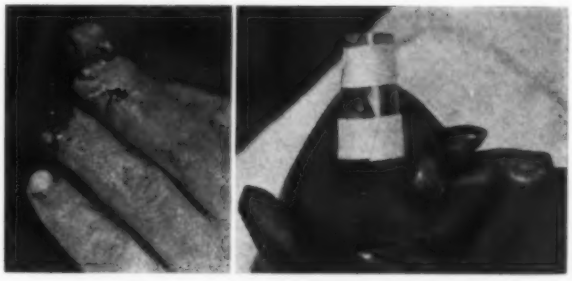

Fig. 3.
Left: Amputation through distal phalanx ring finger, incomplete severing of middle finger distal phalanx stump preserved. Right: Amputation (traumatic) through phalanx treated with protecting thimble

Fig. 4.
Granulating stump after thimble treatment, ready for secondary skin grafting

It is desirable to maintain this traction in a position of semiflexion.

Major Injuries

SEVERE crushing and mangling trauma of the hand may comprise any combination of the previously considered injuries, including compound fractures. In dealing with these conditions the same fundamental principles are invoked, special emphasis being placed on maximum conservation of tissue. Accurate evaluation, thorough though cautious debridement, maximum accurate repair of structures, and the application of effective protective and retentive apparatus constitute a major surgical exercise requiring optimum operating conditions. Following operative measures, active and continuing skeletal

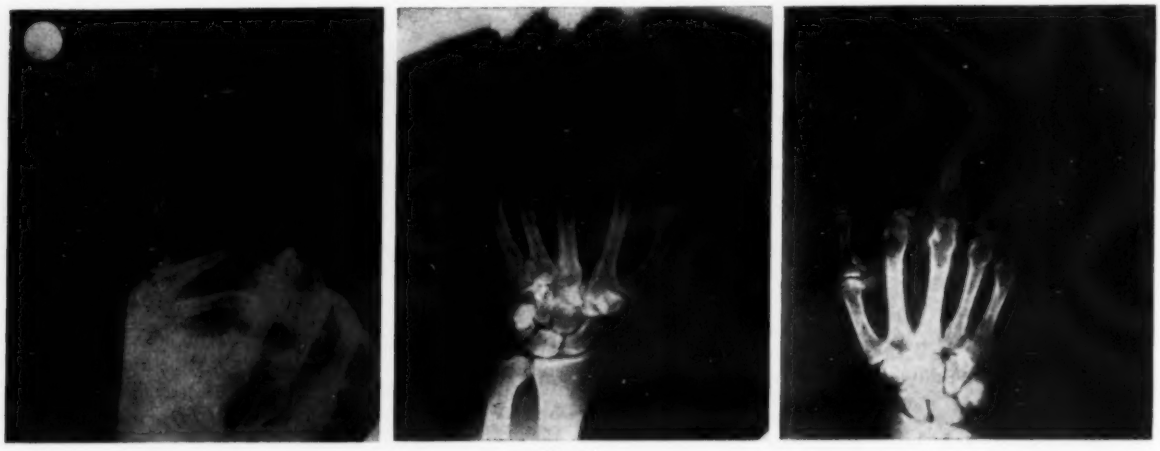

Fig. 5.
Left: Distorting effect of flat splinting in simple fracture of phalanx. Center and right: Reduction and maintenance of oblique phalanx fracture by skin traction

traction has proved most helpful in securing and maintaining reduction of severe bone injuries. Under favorable conditions where little time has elapsed and contamination is minimal, quite extensive initial repairs may be successfully undertaken.

The immediate injury having been dealt with according to these principles, later reconstructive surgery, as required, may be undertaken under optimum circumstances.

IN CONCLUSION, it is my belief that in the treatment of the injured hand the following "Ten Commandments" should be observed:

1. Do not further damage the freshly injured hand by cleaning, exploration or antiseptics, but protect it by voluminous, firm, sterile dressings until the operating room is reached.
2. Do not undertake investigation or definitive treatment except under aseptic conditions, with good lighting, proper instruments, adequate assistance, perfect anesthesia, and in a bloodless field.
3. Determine the nature and extent of the damage by careful and thorough examination.
4. Conserve with care all tissues that may survive, but accurately remove all foreign matter and devitalized tissue.
5. Do not shorten amputation stumps to shorten healing. Length is important for future usefulness.
6. Repair injured structures accurately, uniting all severed nerves including the digital branches.
7. Do not repair lacerated flexor tendons when divided in the digital canal.
8. Provide tissue coverage for tendons, nerves and bones. Leave no raw surfaces, using skin grafts if needed, at once or at the earliest possible moment during healing.
9. Do not splint fingers, hand or wrist in flat or straight position. To conserve function, immobilize in the position of function. Immobilize no joints that may safely be left free to move.
10. Encourage directed active exercise as the best means of restoring function after healing.

(620 Park Ave.)

Fig. 6.
Crushing amputation with loss of fingers and metacarpal heads. Conservatively debrided with later skin grafting. Eventual reconstructive surgery for digitating metacarpals produced a functioning member

Stenosing Tendovaginitis
— A Survey of Findings and Treatment in 49 Cases —

LEO FREDERICK MILLER, M.D.,
Chicago

THE first report of stenosing tendovaginitis is usually credited to DeQuervain,[1] who described five cases in 1895. Patterson and Jones,[2] however, found mention of "washerwoman's sprain" in the 1893 edition of Gray's Anatomy, and concluded that the condition was fairly well known before DeQuervain's report. Most of the reports since the original one have been in European literature. The condition was first mentioned in American literature in 1927 by Stein,[3] and Brown[4] made the first British report in 1935. Apparently it often passes unrecognized.

Because the condition is progressive and may become chronic if not properly diagnosed and treated, because it is painful, and may become disabling, and because it usually affects working persons, to whom the disability represents economic loss, a survey of 49 cases is presented to assist early diagnosis and treatment.

Signs and Symptoms

THE classic picture described by DeQuervain consists of pain radiating from the radial styloid process down the thumb and up the forearm, slightly swelling in the region of the tendon sheath, pain on movement of the thumb and wrist, and inability to grasp objects firmly. Operation shows fibrous thickening of fascia of the tendon sheath, constricting the enclosed tendons.

Presented at the Section Meeting on Hand and Restorative Surgery at the Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, April 25, 1950.

Goeldel,[5] reporting nine cases of styloiditis, said that epicondylitis of the styloid process of the radius may be confused with stenosing tendovaginitis. Flörcken[6] reported two cases in which his original diagnosis of tuberculosis of the radius was excluded by roentgen examination. Hauck[7] stated that there are no marked macroscopic or microscopic differences between true stenosing tendovaginitis and stenosing tendovaginitis associated with snapping finger.

Occasionally the condition is bilateral. Most authors have found no predilection for one hand or the other, but in our series the right hand was involved in 31 cases and the left in 19, including one case of bilateral disease.

Many authors have limited the diagnosis to the radial styloid process, but Burns and Ellis[8] reported similar thickenings in other tendons in their series of 28 cases, and there seems to be no reason for the limitation. In our series the lesion occurred at the radial styloid process in 22 cases, at the base of the thumb in 14, at the base of the index finger in four, at the base of the fourth finger in six, and at the base of the fifth finger in two; in one case the bases of both thumbs and the left fourth and right fifth fingers were involved.

Incidence

THE condition is common, although not often reported. Winterstein[9] found a ratio of approximately 10 women to one man in a review of 140 cases, to which he added 14 of

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 1 (left): Anatomical study forming common sheath of flexor communes. Fig. 2 (center): Tendons removed revealing ligamentous vaginalis. Fig. 3 (right): Anatomical study with anterior section of ligamentous vaginalis removed revealing its relationship between the tendon and vaginal sheath. The above drawings are from the "Hand Atlas of Human Anatomy" by Werner Spalteholz

his own. Finkelstein[10] observed the condition in four men and 20 women, and Schneider[11] in 14 men and 121 women. Aitken[12] reported that the disease was growing increasingly common among women with their influx into industry during the war. In our series there were 14 male and 35 female patients.

DeQuervain's[13] patients were between 25 and 55. In Winterstein's[9] review the average age was 55. Burns and Ellis[8] had patients between 15 and 49, with an average age of 35. In our series there were 23 patients between 17 and 50, 20 from 50 to 69, and six between three months and five years.

Cause

THE condition usually is attributed to trauma or over-exertion. DeQuervain[13] said that in most of his cases over-exertion in housework was responsible, although there was a history of gout or rheumatism in a few. Poulsen[14] suggested that the lesion might be periostitis due to traction by the fascia of the tendon sheath. Michaelis[15] attributed the disease to chronic inflammation of the ligament, producing constriction of the tendons and thickening of the sheath. Burk[16] expressed the opinion that habitual subluxation of the carpometacarpal joint causes the lesion. Keppler[17] concluded that protracted or repeated aseptic irritation causes chronic inflammation. Troell,[18] reporting six cases among which the lesion was associated with snapping finger in one and followed tendovaginitis crepitans in another, opined that stenosing tendovaginitis and snapping finger have the same cause. Hanson[19] described incomplete rupture of the tendon following trauma. Cotton, Morrison, and Bradford[20] reported a case in which the disorder followed flycasting with a light rod. Eschle[21] reported a case in which fracture of the radial styloid process had been followed by callus formation and stenosis. On the basis of a review of 110 previously reported cases and 19 he had observed, he suggested that thickening of the tendon sheath over the styloid process usually is produced by increased friction of the tendons of the two muscles over the long groove at the distal end of the radius. This friction may be increased quantitatively by exertion, with the tendon sheath becoming edematous and causing more friction until thickening occurs. Friction may be increased qualitatively also if the normal smooth osseous bases are changed by trauma.

Eighhoff[22] reported five cases and concluded that in some the cause is mechanical. He described the mechanism as follows:

"Work requiring a constantly repeating movement of the wrist, especially in ulnar abduction, with the thumb fixed on some object. With each movement in this position, the tendons of the extensor brevis and abductor longus muscles become taut over the styloid process of the radius and press upon the tendon sheath, which is unable to avoid the pressure because it lies close to the bone. As a second factor,—during the ulnar abduction of the hand with a fixed thumb, stretching of the entire tendon sheath is produced. The extension of the tendons of the two muscles is strongest when the thumb is in opposition to the hand in middle posture. If the hand with the thumb is now abducted in ulnar direction, then both tendons, and with them the tendon sheath, must be overstretched. A simple experiment will verify this assumption. If one places the thumb within the hand and holds it tightly with the other fingers and then bends the hand severely in ulnar abduction, an intense pain is experienced on the styloid process of the radius, exactly at the place where the tendon sheath takes its course. The pain disappears the moment the thumb is again extended, even if the ulnar abduction is maintained. In cases of forced abduction of the hand without simultaneous involvement of the thumb, one does not succeed in evoking this pain. Thus repeated overstretching of the tendon sheath results in an injury to the gliding mechanism."

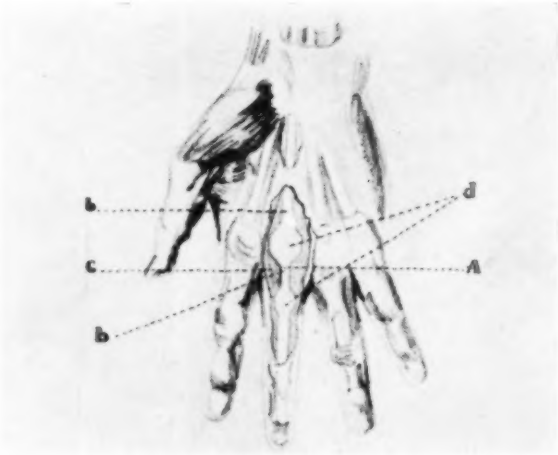

Fig. 4.
Schematic drawing, typical appearance of pathological changes as seen in the operating room. Drawing from the "Hand Atlas of Human Anatomy" by Werner Spalteholz

Potter[23] said the cause may be acute trauma but usually is sustained or repeated active adduction from a position of extreme abduction.

Among our 49 patients, nine had suffered injury, two among the six children. The fact that most of the patients were housewives or used their hands in other occupations favors the theory that exertion is an important factor.

Treatment

MANY methods of treatment have been used. In two of DeQuervain's[1] original cases he incised the tendon sheath, and produced immediate relief. Baking, massage, rest and immobilization were ineffective. Welti[24] extirpated the entire fascia of the tendon sheath, with a good result. Flörcken[6] tried conservative treatment, without effect. Marion[25] used conservative treatment. Keppler[17] operated in 17 of his 25 cases,

TABLE 1.
COEXISTING PATHOLOGIC PICTURE IN 49 CASES

None	31 cases
Chronic inflammation	9
Arthritis	4
Fibrosis	3
Degenerative change	2

Note: Such additional abnormalities as thickening of the sheath, evidence of calcification, bursa and the presence of myxedema cells occurred in one case each.

and reported that the condition did not recur in any of the 11 in which follow-up was possible. Reschke[26] had many failures from conservative treatment of acute lesions and stated that when the condition is chronic, division of the compartment of the tendon sheath is the only effective treatment. Eschle[21] found 66 cases in the literature in which operation had been done; cure was complete in 65 of these, and improvement had occurred in the other. In his own 19 cases operation was successful in all Winterstein[9] reported complete success in the four cases among his 14 in which operation was done. Schneider[11] used conservative methods in 13 of 15 cases and reported cure in 60%—a result surpassing any other reported for conservative treatment. His procedure was to apply a plaster cast to the wrist and thumb, with the thumb in full extension and abduction, and leave the cast in place from four to six weeks. Among patients not helped by this treatment, two were relieved by operation.

After observing six cases, Patterson[27] stated in 1936 that the only non-operative treatment worthy of trial is immobilization of the thumb in a plaster cast for six weeks, and the discomfort of wearing the cast for such a period, particularly for a manual worker, makes the treatment unsatisfactory. In a latter report Patterson and Jones[2] said that operative treatment is so simple, relief so prompt and disability so brief that it should be the method of choice in all cases. Keyes[8] stated that palliative measures usually give relief. Wood[29] said the operative procedure is simple and gives excellent results.

In our series only surgical treatment brought 100% results. A few patients were relieved by conservative measures, but several, like the one treated by McDonald and Stuart,[30] required operation after other measures had failed. For this reason I concur in the opinion of many others that operation is the method of choice in the treatment of stenosing tendovaginitis.

Summary

BECAUSE stenosing tendovaginitis is a common disorder, although often unrecognized; because it is painful and becomes disabling when neglected; and because treatment is simple and effects prompt relief, a survey of 49 cases is presented.

Since conservative methods of treatment often are unsuccessful and cause inconvenience even when successful, and since surgical treatment is simple and effective, operation is recommended in all cases.

(116 South Michigan Ave.)

TABLE 2.
TREATMENT AND RESULTS IN 49 CASES

Treatment	(No. of Cases)	Result: Good	No Relief	Unknown
Operation	20	20*		
Physiotherapy	10	5	4	1
Immobilization	4	1	1	2
Roentgen Therapy	1	1		
None	14			

*In some of these conservative measures were tried first, without result.

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Primary Care of the Injured Hand

WILLIAM F. LAUTEN, M.D.,
Chicago

ALTHOUGH the percentage of hand injuries, when compared with total injuries, has remained a constant figure (30 to 33%), the total number of hand injuries has increased as more persons have been employed in industry and the production rate has become accelerated in industries where a high percentage of hand injuries occurs. This does not detract from the constant effort by employers and underwriters to improve safety methods and appliances. However the fact remains that the total number of hand injuries is increasing.

Great advance has been made, in recent years, in the care of the injured hand but it would be absurd not to admit that there is much to be accomplished. All too frequently the injured hand is approached with an indifferent attitude and the treatment corresponds to this attitude. Many wounds are doused with alcohol, painted with tincture of merthiolate, a suture or two closes the wound, and the injured employee is sent back to work with the contamination that accompanies every wound of the hand sealed deep in the wound to spread as an infection and thereby increase the morbidity and often result in permanent loss of function. The finger that does not flex at the middle and proximal joints is functionally lost.

The injured hand must be considered a surgical problem and treated as such. It should be borne in mind that all hand wounds are contaminated and must be converted into clean wounds. The first attention frequently determines the future function of the wounded hand. Haste and too zealous treatment will lead to disaster. The hand is a complex mechanism, with many gliding surfaces which are destroyed by infection. A thorough knowledge of its anatomy and mechanism is essential to the successful treatment of its injuries. The impaired hand is a greater hazard to the patient than it was before his injury.

History

A FEW minutes to obtain a history will be well worth while in directing the course of the first attention. This should include (1) the manner and conditions causing the injury; (2) the type of contamination present as determined by the patient's activities or occupation at the time of the injury, as this will frequently furnish information about possible imbedded foreign bodies; (3) the position of the fingers and hand when injured—whether extended, partially flexed or tightly clenched; and (4) what treatment was given before the injury was seen, such as iodine, oil, chewing tobacco, cow manure, etc., as this is important in determining the introduced contamination.

Time Since Injury

AS ALL HAND wounds are contaminated, the period of time since the injury is important. Wounds less than four hours old can be handled as non-infected, unless the character of the wound is such as to make it impossible to remove the contamination. Wounds of any character that are more than four hours old must be considered infected and treated accordingly. Infection contra-indicates manipulation or movement.

Operating Conditions

EXTENSIVE wounds of the hand must be handled under operating-room conditions. The surgeon should wear cap, mask, sterile gown, and gloves. Ample drapes should be available to afford complete protection. Small instruments particularly adaptable to this type of surgery should be at hand. Unless these conditions can be met, hospitalization is recommended.

Tourniquet

AS A DRY field is important, the use of a tourniquet is necessary. The arm is elevated for several minutes and an Esmarch band is spiraled around the hand from the most distal point available to a distance at least three inches above the flexor surface of the elbow joint. A blood pressure cuff is then applied above the Esmarch band and inflated to 80 mm. above the systolic pressure of the patient. The pressure should never be elevated above 300 mm. The Esmarch band is then removed by spiraling off the hand and arm, beginning at the most distal point and working upward. This is a modification of the method advised by Bunnell.

Preparation of the Skin

THE WOUND is covered with fresh sterile gauze, and the skin is shaved on the hand and arm. Then the entire hand and arm are washed with sterile soap and water, using a gauze sponge in place of the customary brush. This prevents minute abrasions on the already damaged skin. The skin is now rinsed freely with water and wiped with a sterile alcohol sponge. A solvent should be used to remove oil, tar, grease, paint, etc. This should be applied with a minimum amount of irritation to the skin but thoroughly removed.

With a hand board or small adjustable table at the side of the operating table, draping of the operating field is the next step. Care should be exercised to avoid undue pressure where the elbow joint is in contact with the board or table, by placing a soft pad between the elbow and board.

Draping

THE ARM BOARD or table is covered with a sterile pillow case or folded sheet, and a towel placed over this drape. The hand and arm are now elevated by support above the elbow, and a sterile towel is wrapped around the wrist and arm. Some operators use a sterile stockinet that has been rolled as a doughnut. The hand is now lowered to the board and the arm above the elbow covered with a towel. From here on the drapes are the same as for any other operation with full-length sheets. Draping should be in a manner that can be removed without manipulation of the operated hand.

The surgeon now has a dry wound lined with traumatized tissue and is ready for the debridement and such repair as may be indicated.

Debridement

THE object at this point is to convert a contaminated wound into a clean wound. The following methods have been successful, and are presented in the order of their importance according to the author's experience.

FLUSHING METHOD: Flood the wound with a large amount of sterile water or saline—10 gallons. All tissue that, during the flushing, appears devitalized is excised. White or shredded tissue is removed with a short, pointed five-inch scissor, using tissue forceps to handle the tissue. Stained tissue is also removed at this time. A search is made for any suspected embedded foreign bodies, and the extent of tendon, nerve or large vessel damage is observed. This method is objectionable only from the quantity of water used, as it requires frequent changes of the basin catching the overflow. The water is allowed to flow into the wound from a small, suspended, sterile tubing with a metal or glass tip. It must not be introduced with excessive pressure. This quantity of water will wash away much of the surface contamination.

STAINING METHOD: Douse or freely slop the wound with tincture of iodine that has been diluted to twice the volume, half-strength, with alcohol. Any that stains the skin is removed with alcohol. All exposed tissue is found stained with the iodine. This must be meticulously removed to a depth of two or three millimeters. Damaged tendons should be freshened by removal of a minimum amount of tissue. Severed nerves should be approximated by a single suture, but it is better to delay permanent repair until the progress of the wound is observed. Spicules of bone may be removed at this time. This procedure, giving complete excision of the traumatized tissue of the wound, prevents spread of infection. Methylene blue may be used in the same manner as the half-strength tincture of iodine but is objectionable as it continues to spread, restaining the tissue during the debridement so that it may be difficult to know just what tissue has been previously excised. When used, it must be applied gently and all excess removed before the excision of tissue has been started.

The wound is now clean, and if the damage is not too extensive, repair can be made. Catgut or other foreign bodies should be introduced into the wound in a minimum amount, as they offer harbors for infectious material. Catgut used for ties should be of plain gut and 000 or 0000 gauge. Silk should be the finest. No. 38 or 40 stainless steel wire, as suggested by Bunnell, is less irritating to tissue and causes no tissue reaction.

The primary repair of tendons depends upon the type and condition of the wound. Crushed or frayed tendons do not respond well to primary repair. Only such tendons as have been severed by a sharp cut, without extensive damage to surrounding structures, will respond to immediate repair.

Primary repair of nerves is not satisfactory; they should be brought in apposition by simple suture to maintain their normal relation for secondary repair. The nerve should be freed from surrounding tissue, and a single transverse suture used to approximate the ends.

Protect All Vital Structures

NERVES, tendons, joints and bones must be protected by covering before the wound can be closed. Severed muscles should be brought into position and repaired. Fascia should be closed or brought into the best apposition that circumstances permit. Unless the contamination is so gross that there is definite contra-indication, the denuded area should be skin-grafted with split grafts. These should be merely for the purpose of closing the wound and not be more than .012 thick. Later a full-thickness graft on all pressure areas will be necessary. Although one-stage pedicle grafts from the abdomen are not as satisfactory as two-stage grafts, there are occasions where it is advisable to embed the injured hand or wrist in the abdominal wall in one stage. The use of a double-pedicle graft in the form of a pocket is probably the most satisfactory single-stage type of full thickness graft. The donor area is best covered with a split graft from the thigh and the dressing incorporated in the dressing of the hand.

Primary repair of tendons must depend upon the type and condition of the wound. Attention is called to the avoidance of placing large masses of silk in tendon repairs. The author has many times removed a large mass of scar tissue from tendon repairs that resulted in non-function of the tendon.

Drainage

THE most satisfactory drain for the hand is by way of eighth-inch rubber bands that have been cut and are placed both superficially and deeply in the wound, avoiding contact with tendons and nerves. They average three in number per hand, and are never left in place over 48 hours.

Dressing

THE initial dressing should be applied smoothly, and with even contact. It is often advisable to moisten the deeper layers of the dressing. Over this is placed fluffed gauze or sponge rubber or some other soft resillient material which gives a firm but not binding dressing. Loosely packed gauze is placed between the fingers so as to spread them slightly. The entire hand is then mounted on a splint and covered with an elastic bandage loosely applied.

Fractures

FRACTURES do not require immediate attention and may be left for four or five days before reduction need be made. In the interval there should be a reduction of the edema that always accompanies the badly injured hand and handicaps the primary reduction of the fractures of the hand.

Position Retention

THE proper position of the hand is in the functional position. The fingers are semi-flexed as though the patient were holding a ball four inches in diameter. The thumb is flexed in the same position except that it is rotated so that it is at right angles to the palm. The metacarpal-phalangeal joint is slightly flexed and the distal joint is flexed about 45°. The wrist is dorso-flexed. A cup-type splint is best when the entire hand is to be immobilized but the uninjured digits are to be left free to move in their normal range.

Casts that are applied should not extend beyond the distal transverse crease of the palm. On the following day the dressing should be removed and reapplied so as to relieve pressure from the secondary edema that always accompanies this type of wound. At that time the color and viability of the skin should be observed. Casts should be split lengthwise and reapplied, fastening the two halves with adhesive so as not to exert pressure. Soiled dressings except those immediately over an open wound can be replaced at this time.

Elevation

THE HAND and arm should be elevated to 45° with elbow joint extended 50%. Complete flexion of the elbow joint frequently results in increased edema. This position should be retained until all edema has subsided.

Postoperative Care

TETANUS antitoxin should be given and antibiotics started immediately. Sufficient narcotics should be given to relieve acute pain. One-sixth grain M.S. the first 24 hours will usually suffice. Sulfa drugs may be given, but the patient should have the usual observation for sensitivity. Complete bed rest is indicated until the edema subsides and the temperature is normal.

Conclusion

IN THE absence of fractures or severed tendons, motion should be started as early as possible. Daily dressings are to be avoided, as they disturb the healing process and delay recovery.

Dressings should not be relegated to any but experienced observers, as any drainage, discoloration, or undue edema are indications for close observation.

Severed tendons and fractures must be restrained for from three to four weeks.

Summary

THE HAND is highly mechanized and sustains the highest percentage of injuries that occurs to any part of the body.

Conditions surrounding the accident are important to the care of the injury.

Early care of the hand—within four hours—is important to prevent the spread of contamination to infection. All injured hands are contaminated.

Operative procedure is indicated in damaged hands.

General anesthesia is best.

Proper debridement prevents the contamination from becoming an infection.

Vital structures must be protected first.

The hand must be elevated to prevent excessive edema.

Our Turn May Come

THERE is creeping into our government, sometimes by chance, sometimes under the guise of emergency, and sometimes by the carefully calculated designs of dissatisfied individuals, a socialistic philosophy and a socialistic approach to the problems of the day that are destroying the free enterprise system that has made our nation so great. We see it in the mighty pyramid of government—layers upon layers of costly administration for whose support billions of dollars that ought to go into productive effort are diverted into taxes and given away as subsidies. We see it in the attacks that are made on business as such as if there were something sinister about financial gain and economic profit. We see it in the growing regulation of some business enterprises and the very specific attacks that are being made upon others. Government intervention is on the march in the medical and agricultural fields. Not so long ago it was public utilities. Tomorrow it may be some other free enterprise. No business is immune. Our turn may come.

—From "Today's Challenge," an Address by W. Ross McCAIN, President, National Board of Fire Underwriters, May 25, 1950.

Acute Bowel Obstruction
— Method of Decompression of an Acutely Obstructed Colon —

CLAUDE J. HUNT, M.D.,
Kansas City, Missouri

THIS discussion is centered around the value of a scout film of the abdomen in making a diagnosis of acute bowel obstruction, in locating the site of the obstruction and in differentiating, to a rather accurate degree, the type of obstruction present. Emphasis is placed upon the diagnosis of acute colon obstruction, and a description of our method of surgical decompression is presented.

A fairly accurate differential diagnosis can be made and a decision for or against immediate operation in advanced obstruction can be determined by a properly interpreted roentgenogram of the abdomen. In one type, the simple type of obstruction, where the blood supply of the bowel is not impaired, adequate time can be taken for physiologic rehabilitation and bowel decompression, while in the strangulated type, gangrene and peritonitis are imminent and operation cannot be delayed.

It must be remembered that gas can be demonstrated normally in the stomach and colon but not in the small intestine. Only in newborn infants can gas be seen by radiographic study in the small intestine. When present it indicates some interference with the continuity of the small bowel, and the pattern assumed by the distended loops indicates in a large measure the nature of the obstruction.

Schwarz and Case, early in the century, called attention to the significance of gas observed in the small intestines by a roentgenogram. Many radiologists have described characteristic gas patterns in obstruction of the small bowel and have emphasized differential radiologic diagnostic criteria between simple and strangulated obstruction. Lockwood placed great significance on the visibility of the valvulae conniventes as a differential aid in distinguishing between simple and strangulated obstruction. It must be remembered that these markings are more apparent in the upper part of the small bowel than in the lower and that they may be observed even early in strangulated obstruction.

The roentgenogram is the only means by which one can make an early diagnosis of small bowel obstruction and can determine accurately the type of obstruction present.

Gas can be demonstrated in the small bowel within a few hours after obstruction has occurred, and the pattern it assumes in relation to the long axis of the body and the presence or absence of valvulae conniventes are the most significant points in differential diagnosis.

Presented at the Sixty-Second Annual Meeting of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Chicago, April 4-6, 1950.

Simple Obstruction

IN SIMPLE obstruction the proximal bowel distends, coil by coil, and gradually assumes a transverse relationship to the long axis of the body and the valvulae conniventes can be seen. When the obstructed bowel assumes this characteristic stepladder pattern with these characteristic markings, it can be said with relative certainty that the blood supply is not in jeopardy and that adequate time can be taken to intubate the intestines, deflate them and rehabilitate the patient.

An operation can be done then at a later date, as an elective procedure when the patient is in an anatomic and physiologic state for operation. Enterostomy is not indicated; it is ineffective and dangerous. Besides the danger of spillage, contamination and subsequent peritonitis, the upper small bowel may be drained and add materially to the nutritional problem. This deferred operative treatment applies only to the cases of advanced obstruction, as all patients with early obstruction should be operated on immediately.

If this pattern of bowel distention is observed to be associated with an inflammatory process, it will subside as the inflammation recedes and operation for obstruction will not be necessary. I have seen this on many occasions and, even when it has been observed early, I have used intestinal intubation with satisfactory results. On the contrary, if the distended loop of bowel assumes no definite pattern, is found distended in an irregular manner and is darker than in the previous type, and if the valvulae conniventes are not seen or are poorly visible, it may be said that the obstruction is one of a strangulated type. The blood supply is impaired and immediate operation is imperative. Efforts toward complete physiologic rehabilitation must be deferred until after operation.

It will be noted, as has been mentioned by Wangensteen, that bowel distention proximal to a strangulated loop of bowel is slow to develop and is rarely seen until strangulation has been present for a long time and until, probably, peritonitis has occurred.

In the illustrations (page 472):

Fig. 1 shows simple type of small bowel obstruction, disclosing transverse position of dilated coils of bowel and visible valvulae conniventes.

Fig. 2 shows dilated loop of small bowel, black in color; valvulae conniventes not seen indicating strangulated obstruction.

Fig. 3 shows operative specimen of gangrenous bowel shown in Fig. 2.

Fig. 1.
Simple type of small bowel obstruction showing transverse position of dilated coils of bowel and visible valvulae conniventes

Fig. 2.
Dilated loop of small bowel, black in color; valvulae conniventes not seen indicating strangulated obstruction

Comment

THE TWO patterns of simple bowel obstruction and strangulation rarely occur on the same roentgenogram. If they do occur, when there is an irregular loop, dark in color and without vulvulae conniventes, the bowel must be considered as strangulated and immediate operation is imperative.

Thus, the types of extrinsic bowel obstructions are two: simple, and strangulated. In the simple type, the bowel becomes obstructed by angulation or constriction of an adhesive band or from an adjacent inflammatory process and the viability of the bowel is not in danger.

In strangulated obstruction, of volvulus type, the blood supply is impaired and, unless quickly released, will result in gangrene, rupture and peritonitis.

The roentgen pattern in ileus is that of a uniform distention of the entire intestinal tract, including both small and large bowel. The small intestines assume a transverse position, and the colon distends, forming a framelike pattern around the distended small intestines. This is a valuable observation in the consideration of postoperative abdominal distention. When seen it is not dynamic in character, but probably neurogenic.

It sometimes follows trauma or extra-abdominal surgical intervention. A roentgenogram of the abdomen will give this information to a surprising degree of accuracy.

Clinical Observations

SINCE 1940 we have correlated the clinical and roentgen diagnosis with the operative observations and have found them to be dependable and accurate when properly interpreted by a competent radiologist. I reported, in 1945, the results in 47 cases followed by this procedure. In six cases there were inflammatory simple obstructions which were decompressed by intestinal intubation without operation. In 29 cases there

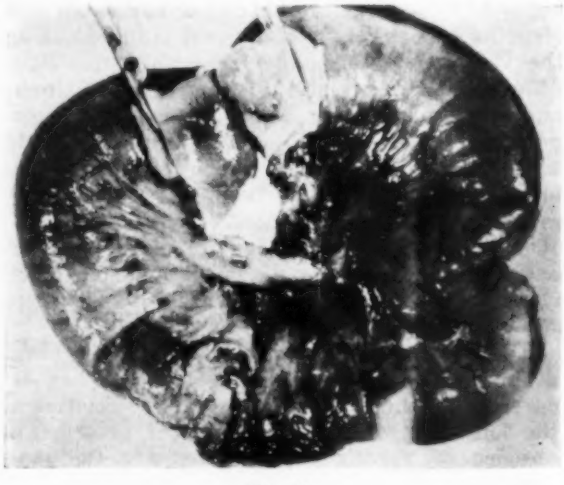

Fig. 3.
Operative specimen of gangrenous bowel as shown in Fig. 2

were simple adhesive obstructions, part of which were operated on immediately and the remainder treated by intestinal intubation and rehabilitation, followed by subsequent operative release of the obstructing agent. In 12 cases the roentgenogram showed the pattern of gas distention, characteristic of strangulated obstruction and operation was performed immediately. Resection was done in four instances with recovery following.

Colon

AN X-RAY film of the obstructed colon does not give us much information as in obstruction of the small bowel. It does show a distended proximal colon with its characteristic Haustral markings but the exact site of the obstruction is often obscure. Localization of the lesion can be determined by a barium enema, if the obstruction is complete and it is then no obstacle to surgery. It can be readily evacuated by enema. It is only when the obstruction is incomplete that subsequent difficulty may be encountered by barium enema. The proximal colon may become impacted with dehydrated barium. It may convert an incomplete obstruction into a complete obstruction.

Barium should never be given by mouth in obstruction of either the small or the large bowel.

The pattern assumed by a distended colon is one that conforms to the anatomical position of the colon and it usually shows the characteristic Haustral markings. As the colon becomes more distended because of the closed loop nature of the obstruction, these characteristic Haustral markings of the colon are not so well seen. These are fine points of radiological interpretation and are easily detected by a competent radiologist.

The colon, therefore, becomes progressively distended and is in reality a double obstruction in which the blood supply soon becomes inadequate to maintain bowel viability. The segment of the colon most distensible is the cecum, the walls of which become extremely thin and ultimately become gangrenous and perforate. This closed loop type of colon obstruction is, therefore, in part, comparable to a strangulated or a volvulus type of small bowel obstruction. It is in reality as much of an emergency as small bowel strangulation. Therefore, surgical decompression should not be long deferred, else gangrene and rupture of the cecum will undoubtedly occur.

Surgical Principles

COLON obstruction presents a complication which prohibits a primary attack upon the lesion, which is quite in contrast to that of small bowel obstruction.

In colon obstruction the problem is to decompress the colon and prepare it for subsequent resection of the lesion, while in small bowel obstruction, surgery is directed primarily toward removal of the lesion.

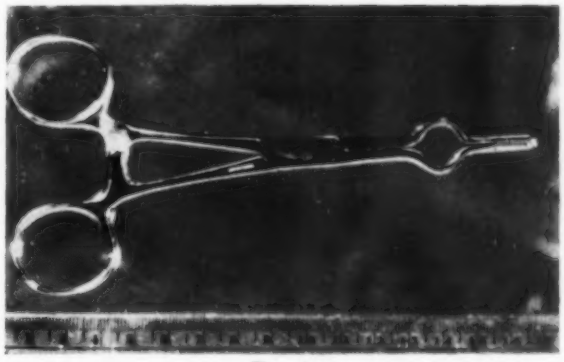

Fig. 4.
Clamp and catheter

Sites for Decompression

OBSTRUCTIVE lesions of the right colon may be decompressed by cecostomy with or without colostomy. Ileo-colostomy is desirable and sufficient when the obstruction is incomplete, fixed and inflammatory.

Lesions in the left colon are usually annular, constricting in character and, at the time of consultation, have a variable degree of obstruction, although a few have complete obstruction. Fortunately, most obstructions are not complete but are in part due to edema, inflammatory reaction and invaginated mucous membrane. Under proper surgical decompression and by irrigations the obstruction may relent sufficiently to permit the colon partially to empty itself through the distal segment. This materially aids the thorough cleansing of the colon.

Surgical decompression for distal lesions can be done by cecostomy or transverse colon colostomy, the latter being preferable if the lesion is low in the left colon. However, in complete obstruction with extensive proximal bowel distention this is not always easy. Often the distended right transverse colon is pushed high under the liver by the enormously distended cecum, which displaces everything well toward the midline and upward, so the transverse colon is difficult to approach and deliver.

The paper thin bowel wall will not withstand trauma, and it is the mark of wisdom to decompress the colon at the most approachable point. This usually is the cecum.

The procedure is a life saving measure and safety should not be compromised because of efficiency of subsequent colon irrigation. The left colon can be irrigated and cleaned through a cecostomy opening but not as easily as through a colostomy.

Mortality

WAGENSTEEN, DENNIS, *et al.*, report a mortality rate, 53 cases with 15.1%. Brindley reports seven deaths in 34 cases of acute malignant obstruction, 20.6%; Gregg and Dixon—121 cases, 34.7%. We had four in 15 cases—26.6% and none in 10 others, performed by our present method, using our special colostomy clamp.

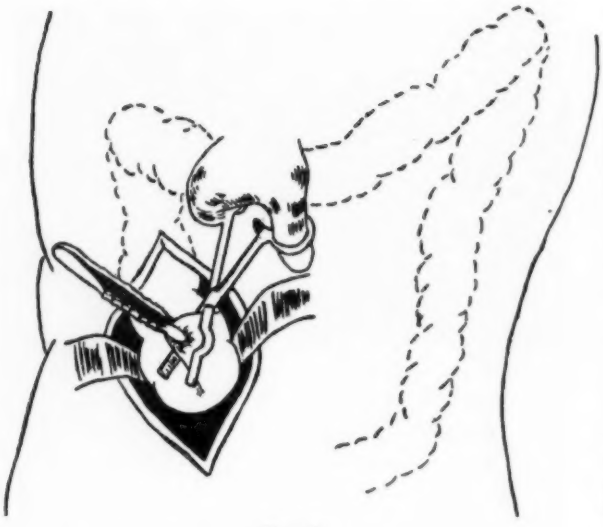

Fig. 5.
The blunt thumb forcep grasping the bowel at the site of needle puncture. The clasp with round ring is being applied and a cone of bowel is shown above the clamp

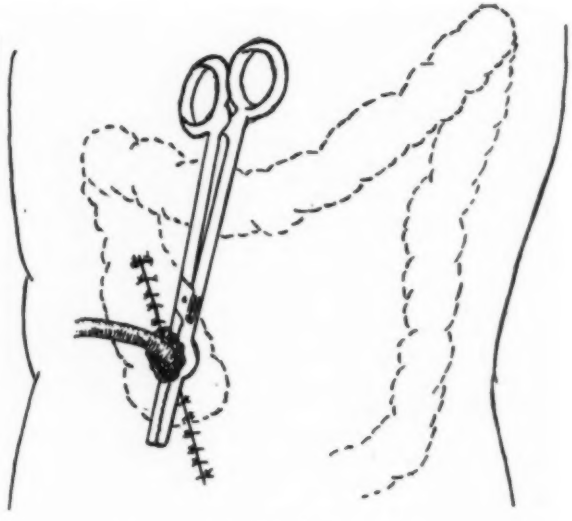

Fig. 6.
The abdomen closed around the clamp with the enclosed bowel and a F. 20 catheter inserted into the colon through the ring and fixed by one suture through the protruding cone of clamped bowel

Loop Colostomy

LOOP colostomy is difficult to do in acute colon obstruction, the enormously distended colon can not be well elevated above the skin level to be supported by a glass rod. Decompression by needle aspiration before elevation opens an avenue for contamination through the site of needle puncture. Manipulation is harmful; bleeding may be encountered in the mesentery from passing the supporting rod; pressure may cause bleeding or bowel necrosis. It is not possible in the distended cecum. Catheter insertion into the cecum is attended by great danger of spillage. It is insufficient and offers poor facilities for future bowel irrigation. We have abandoned both procedures in acute obstruction of the colon for the one we now describe.

Procedure for Colon Decompression

IN ACUTE colon obstruction we deflate the distended bowel by needle puncture, grasp the deflated bowel, at the point of needle puncture, with a flat, no tooth, thumb forcep, and apply our special colostomy clamp to the suspended cone of bowel; proceed to close the abdomen around this protruding segment of colon, and then open the bowel and insert into the colon through the round opening in the clamp an 18 or 20% catheter. This procedure exteriorizes only a small segment of the colon but gives an adequate vent for gas to pass through the catheter.

If the colon contains mostly liquid material and little gas, it may be deflated sufficiently to apply the clamp, (pack around it to protect against spillage and contamination) open the cone of bowel protruding through the clamp ring, insert a large size catheter, ligate the bowel tightly around the catheter and irrigate it sufficiently to deflate it adequately for exteriorization.

The clamp can be removed in two or three days after the bowel has adhered to the abdominal wall and bowel irrigations may be started. This procedure does not completely divert the fecal current and it is only advocated for an acute obstruction, due to cancer, where resection is subsequently contemplated.

Fig. 4 shows clamp and catheter.

Fig. 5 shows the blunt thumb forcep grasping the bowel at the site of needle puncture. The clamp with round ring is being applied and a cone of bowel is shown above the clamp.

Fig. 6 shows the abdomen closed around the clamp with the enclosed bowel and a F.20 catheter inserted into the colon through the ring and fixed by one suture through the protruding cone of clamped bowel.

Fig. 7 shows the clamp in place and catheter inserted through opening in clamp into the bowel.

The catheter acts as a vent largely for gas

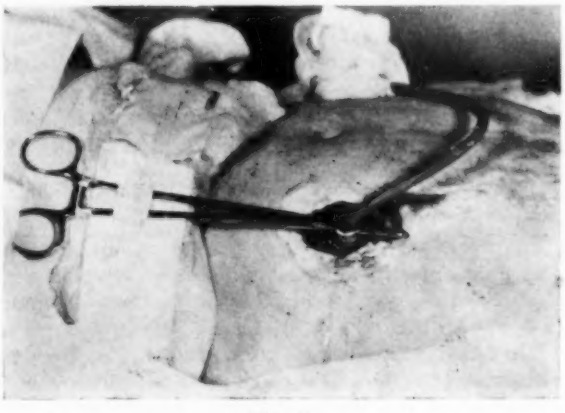

Fig. 7.
The clamp in place and catheter inserted through opening in clamp into the bowel

and prevents re-distention of the bowel. The clamp is removed later or it sloughs off and the bowel is then irrigated and cleansed. This method is simple, practically aseptic and performed without difficulty. There is no contamination. It is extra peritoneal.

Summary

DESCRIPTION of the radiological difference between simple small bowel obstruction and strangulated obstruction is described. Value of the scout film of the abdomen in making a diagnosis of acute bowel obstruction is emphasized.

2. Distinguishing features between obstruction of the small bowel and obstruction of the colon are discussed.

3. Characteristics of progressive colon obstruction are described, danger of perforation is emphasized and its similarity to strangulated small bowel obstruction noted.

4. Method of decompression of an acutely obstructed colon is described and discussed. Description of our technic with presentation of clamp is shown.

Loop colostomy does not seem appropriate for decompression of an acutely obstructed colon.

Decompression of distended cecum by tube insertion is associated often with spillage and contamination. The procedure we have described is not likely to be associated with spillage and soiling.

(1612 Professional Bldg.)

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The Semantics of Cancer

IN A "Treasury of Great Reporting," Rebecca West speaks of a fascist pamphlet in these striking terms: "It was as if a man walked in with his clothes held open to show a cancer." This may be great reporting, but to a cancer patient and his family, it is like being struck with a whip.

The word "cancer" has become the rubber stamp which unimaginative writers use in lieu of thinking up a more descriptive term. A random sampling of a few newspapers shows the following examples of this cliché:

"Douglas told the Senate that the country's slums were a moral cancer."

"Marquand confesses that this fails to assuage the cancer of an inferiority complex."

"The Attorney General said that this cancer in the body politic should not be covered up."

"Advocating expulsion of communists from the C I.O., Reuther said that the body politic has a cancer and that we have to save either the body or the cancer."

"Our divorce laws aggravate an already cancerous condition in our society and morals."

"The Far East is so riddled by the malignancy of poverty and ignorance as to . . ."

"Heavy sentences in the gambling cases will combat this cancerous condition in New Jersey."

"Europe cannot preserve its civilization with this cancer at its edge."

"The cancer of discrimination is a threat to the American ideal."

"The current tendency to defame public officials is a dangerously growing cancer."

Here then are 10 samples, selected from newspapers within a few weeks. Do you think it took a fine comb to go through the papers and make these selections? No. A patient who had had a cancer removed picked the phrases out without half trying. To him, the word "cancer" leaps out of the printed page and hits him in the eye—and in the heart, too. With commendable courage, he has persuaded himself that cancer is not necessarily malignant, that it can be cured and that in his case, it has been cured. Must he continue to see the word flaunted daily as a symbol of hopeless malignancy?

The writers who wallow in this hackneyed comparison do not intend to be cruel. But someone must call attention to the caustic effect of their carelessly chosen cliché. They must be reminded that it is agonizingly jarring to every cancer patient and to all his loved ones.

Since no one seems to have said it before, let it be said now: the word "cancer" must no longer be used as a synonym for everything nasty, malignant or corrupt. It can be a word of hope if only the writers will return it to the dictionary and use some less trite and less tormenting a term.

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Bursitis

GEORGE L. APFELBACH, M.D.,
Chicago

ALL PARTS of the body in which movement is likely to produce friction are provided with secreting synovial liquid sacs, known as bursae. This is our lubricating system. Properly considered, we should also include as bursae the synovial lined joints, tendon sheaths, and even the pleura and peritoneum.

This paper is limited to a discussion of the synovial compartments under muscles and tendons, and near joints, which are known as bursae. Some are constant, others occasional; some are superficial, others deep; some constantly connected with the joints, others never or only as an anomaly.[1]

Adventitious bursae arise at points of abnormal irritation as in a bunion, the kyphos of Pott's disease, over the external malleoli in tailors and at the protruding end of a Smith-Petersen nail. Histologically, these are not the same as anatomical bursae.

Ganglion or hygroma of the tendon sheaths may simulate bursae, but the origin and microscopic findings show a myxomatous degeneration of the tendon sheaths. Although many claims are made under the workmen's compensation laws, only about 20% are considered traumatic, in the literature.

Etiology of Bursal Enlargements

TRAUMA: Contusion, twisting or repeated irritation.

2. Acute Infection: puncture wound, laceration, or hematogenous. Common Organisms: staphylococcus, streptococcus, pneumo- or gonococcus.

3. Rheumatic fever, atrophic arthritis, rheumatic diathesis.

4. Allergies.

5. Chronic Infections: tuberculosis, syphilis, anaerobic streptococcus, brucellosis, salmonella, and fungi.

6. Lead poisoning.

7. Gout—Calcinosis.

8. Metaplasia of the synovium forming foreign bodies such as chondromatosis or osteochondromatosis.

9. Villous synovitis with or without formation of foreign bodies. Pigmented villous synovitis.

10. Neoplasms are not common but include xanthoma, osteochondroma, papilloma, fibroma, fibrosarcoma and synovioma.

Enlarged bursae are not all traumatic. Considerable diagnostic acumen is necessary, especially by surgeons in industry. Just as my grandmother always formed a traumatic etiology in my childhood complaints, whether croup or green apple colic, employees honestly ascribe their bursal enlargements to trauma. Not all enlarged bursae arise from trauma, and in some cases we should investigate by a careful history, transillumination, soft tissue x-ray, pneumoarthography, sedimentation, blood, uric acid, Wassermann, and other tests indicated.

The acute traumatic bursal enlargement seen in industry, usually involves the olecranon or the prepatellar bursa. Puncture of the bursa reveals a bloody serous exudate. If the trauma be in doubt, a villous pigmented synovitis or neoplasm must be considered.

The treatment of the acute traumatic bursa is controversial, but the rule of aspirating traumatic hematomas to avoid the formation of fibrin and fibrous bodies, especially in joints, is indicated in bursae. The enlargement should be treated, where practical, by gentle compression and immobilization. Repeated aspirations are advised by some, but this procedure always creates the hazard of infection. When such treatment ceases to be effective, we look for other pathological changes in the bursa, such as fibrous hyperplasia of its wall or metaplasia of the synovium with formation of cartillagenous or osseous foreign bodies, or villous proliferation without calcification or degenerative changes.

Although some deep bursae may respond to procaine injections and deep x-ray therapy, surgery is indicated in the persistent traumatic type with pathological changes. A clean dissection should be made, and the specimen should be examined microscopically. We feel that sclerosing solutions may obliterate the swelling, but they hide the etiology and do not remove foreign bodies. Recurrences and disabilities are common complications.

The surgical rule of not incising an acute lymphangitis applies to acutely infected bursae. If suppuration occurs, use antibiotics and wait for localization. Incise carefully to avoid neighboring joints.

The following bursae are found around the shoulder:

1. Subacromial—may connect with the subdeltoid bursa and with the shoulder joint.

2. Sub-deltoid—may enter the shoulder joint.

3. Subcoracoid—enters the shoulder joint, between the superior and inferior gleno-humeral ligaments.

4. Subscapularis—always connects with the shoulder joint; seems to be a projection of the shoulder joint on the superior border of the tendon.

5. Intratubercular—surrounds the long head of the biceps in the sulcus.

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6. Coracobrachialis—over the tendon of the subscapularis—may connect with the joint.
7. Subcutaneous acromial.
8. Between the coracoclavicular ligaments.
9. Supraspinatous.
10. Infraspinatous.
11. Teres minor.
12. Teres major.
13. Latissmus dorsi.
14. Pectoralis major.
15. Pectoralis minor.
16. Rarely infracoracoid.

A common error in traumatic conditions is to diagnose bursitis in place of a tear in the musculotendinous cuff or the muscles inserting thereon.

Our diagnostic measures in acute traumatic tears of the cuff are still inadequate, and tears are often overlooked. A bursitis is often diagnosed, but the bursal involvement is secondary and is not the primary cause for the loss of abduction and external rotation.

Capsular changes, degeneration, and bursal changes, even with calcification without clinical complaint are often found operatively in shoulders.[2] They go along with age, wear and tear. We do not know why only some have pain and dysfunction and others do not. We hold that if we were certain of the diagnosis of acute capsular and tendinous tears, we would operate early. As the matter stands, treatment in abduction and external rotation is still the best therapy. Subacromial bursitis must not be confused with tenosynovitis and bursitis of the long head of the biceps, peri-capsulitis, and other joint conditions.

Subcoracoid bursitis occurs in those carrying heavy objects, and is more common in females because the sloping shoulder approximates the coracoid beak to the head of the humerus. Laxness in the capsule anteriorly, in recurrent dislocating shoulders, and unreduced acromioclavicular dislocations cause this type of bursitis.

Diagnosis of a subscapular bursitis should not be difficult because of its location. The pain is greatest in external rotation.

The obscure cases which I dealt with were the ones with deep seated pain in the insertion of the latissimus dorsi and pectoralis major. Possibly, these were bursal involvement.

Recently we saw a bursa the size of an orange pop out from the inferior border of the scapula. Bursitis under the scapulae is a difficult diagnosis. "Clunks" and "clicks" with pain and complaint may be due to subscapular bursitis.

The elbow has only two constant bursae: (1) the olecranon and, (2) under the tendon of the triceps near its insertion.

Bursae are rarely found at the internal or external epicondyles, under the aconeus, or under the insertion of the extens carpi radialis brevis.

Olecranon bursitis, or miner's elbow, is the most common industrial bursitis. The treatment has been given. If suppuration occurs, sinuses may form from olecranon and ulnar osteomyelitis.

The controversial points in tennis elbow have been presented very well by DR. JAMES K. STACK,[3] who stated that several lesions may cause epicondylar tenderness, and pain radiating to the wrist, and inability to raise an object with the forearm extended in pronation.

Tennis elbow may be caused by:

1. Tears at the insertion of the extensor carpi radialis brevis, tears of the common extensor or by both.

2. The bursitis which Osgood[4] described, however, is seldom seen.

3. Impingement of the synovium between the head of the radius and the capitellum causing inflammatory changes, villous hyperplasia. J. C. Allen,[5,6,7] of Australia, has removed this fringe and compares it to the fractured internal semilunar cartilage of the knee. Cure of tennis elbow by manipulation in the era of the British bone setter certainly was not due to bursitis and the synovial fringe. We ourselves have manipulated tennis elbow after procaine injection, with cure in one or several manipulations. In those which were not relieved by this method we have found Stack's and Allen's fringe and synovial thickening, but never a true bursa, as described by Osgood.[4]

The following bursae are found about the hip joint:

1. Trochanteric, large and fairly superficial.
2. Under the gluteus minimus near its trochanteric insertion.
3. One or several at the ischial tuberosity.
4. A fairly large bursa at the origin of the obturator internus.
5. Variations under the insertions of the gemelli pyriformis, and quadratus femoris.
6. Occasionally over the sacrum, coccyx, postsuperior spine of the ilium.
7. Ilio-pectineal—between capsule of hip joint and pectineus. This sometimes connects with the joint and may be mistaken for a femoral or obturator hernia.
8. A bursa under the psoas at the lesser trochanter.

The trochanteric bursa is most often involved, from direct trauma, calcifications and tuberculosis. The writer has seen several of the latter without bone involvement. He also has obtained relief of calcifications by procaine injection, needling and deep x-ray therapy. At times it is difficult to differentiate between a trochanteric bursitis and referred pain from a slipped intervertebral disc.

There are two superficial bursae at the knee joint, the prepatellar and the infrapatellar. The former is involved in direct trauma as the well known "house maid's knee." The latter is usually involved in infectious diseases. Housemaid's knee is seldom seen in religious devotees, since the partial genuflexion of prayer does not bring the bursa in direct contact with the kneeling rail.

Clinically, the stability of the knee joint is dependent upon the internal collateral ligament which is never relaxed, on the quadriceps muscle, and on the cruciate ligaments. Anatomically, the knee joint is a false hinge joint and depends for its strength on the capsule formed by the muscles converging at the joint, namely, the rectus femoris, the vastus internus and lateralis, the sartorius, the popliteus, the two heads of the gastrocnemius, the soleus fascia, the gracilis and the hamstrings—the biceps, semi-membranosus, and semi-tendinosus. The fascia lata and the external collateral ligament should also be mentioned. The movement of all these muscles must be smooth and gliding. Accordingly we find many bursae deeply placed in this region.

The supra patellar bursa is really the largest compartment of the knee joint, extending a hand breadth above the superior margin of the patella, extending laterally and at times medially around and posterior to the femur. In teaching internal derangements of the knee joint at the Cook County Graduate School of Medicine, we have, in the last 15 years, made several hundred dissections on the cadaver, and have found septae between the superior (supra-patellar bursa) and the inferior anterior compartments but, there exists always a connection large enough to permit entrance of the hand. It is impossible to place a Kirschner wire or a Steinman pin in the supracondylar region without entering the knee joint. Infection is risked and the irritation arising from the electric potential of the metal, produces synovitis with adhesions and possible knee stiffness.

This bursa becomes distended with knee effusions, is easily perceived and is the best site for evacuation of post-traumatic joint hematoma.

The semi-membranous bursa, one of the largest bursae in the knee, is placed posteriorly and medially under this muscle, and is frequently connected with the knee joint. When enlarged, it is called a Baker's Cyst"[8,9]; pneumoarthrography usually shows the connection.[16] We recently examined a knee in which a calcified foreign body located in the posterior compartment of the joint radiologically, popped out into a Baker's cyst on extension of the leg. In operating on this bursa avoid longitudinal incisions because of scar contractions. Although a connection with the knee joint may not be evident, suture the pedicle carefully.

The popliteus bursa, not to be confused with a Baker's cyst is always connected with the knee joint. The neck of the sac is wide. It is, when present, a prolongation of the knee joint anterior to the popliteus muscle sometimes as far as the space between the head of the fibula and the tibia.[10]

Another bursa is sometimes found anterior to the popliteus bursa and under the external collateral ligament.[11,12] Calcifications in this bursa give "clunks" similar to a fractured external meniscus.

Other bursae found posteriorly are under each head of the gastrocnemius, between the gastrocnemius and the semi-membranosus, and under the biceps.

The medial surface of the knee has several bursae of which the B. anserinus is the most important.[13] It is about 6 cm. long and is situated between the tuberosity of the tibia and the pes anserinus, which is formed by the tendinous insertions of the sartorius, gracilis and semitendinosus into the medial tibial tuberosity. This bursa is frequently involved in horseback riders and may be the seat of calcification and other synovial pathology.

Voshell and Brantigan,[14,15] have described several bursae under the internal collateral ligament and have suggested that Pellegrinni Stieda's disease may at times be due to calcification in these bursae, and not an ossifying hematoma.

The author has learned more about the knee joint through personal communication from Dr. H. Killikian than from the literature in general.[16,17] Dr. Killikian has used pneumoarthrography in approximately 3000 cases.

With pneumoarthrography he not only demonstrates communications between bursa and the joint, but is able to locate calcifications, villi, adhesions, and to differentiate, by good soft tissue technique, lipoma, neoplasms, and myositis ossificans, and other extra-bursal-articular calcifications. He displaces the patella medially and inserts an 18-gauge needle into the anterior compartment of the knee joint, lateral to the patella. With a syringe and a three-way stop-cock, air is injected. This should be done under strict aseptic conditions, preferably in an operating room, and the x-rays should be taken without delay. Five to six views are taken at different angles.[16]

The differential diagnoses in bursal enlargements of the knee include lipoma, fibrosarcoma, aneurisms, anterior-venous aneurisms, varicose veins, tuberculosis, syphilis and Charcot joints.

Bursae at the Tendon Achilles can be treated conservatively by elevation of the heel, removal of the heel strap and the use of a soft shoe counter. The chronic bursae should be excised.

Conclusions

THE anatomical locations of the more common bursae have been presented.

2. Not all pathological changes of bursae are of traumatic origin. A careful clinical investigation must often be made to determine the etiology.

3. The acute traumatic bursa is best treated by aspiration of the hematoma, gentle compression and rest. Repeated aspirations risk infection.

4. The tennis elbow may have three or more etiologies.

5. Pneumoarthrography is a safe procedure to aid in the diagnosis of bursal enlargements, the anatomical connection of bursae with joints, and the determination of the character of bursal contents.

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Junior Medical Students Learn Industrial Health at Michigan

DURING the past six years at the University of Michigan, a 16-hour course on industrial health has been presented to the Junior medical students. Prior to this current year, though, only the industrial hygiene phases of this specialty area had been emphasized. In the belief that the industrial physician spends but a small portion of his time in the diagnosis and treatment of occupational illnesses, the preventive medical aspects of industrial health were highlighted.

Functioning under the aegis of the University's School of Public Health, the Course Director was DR. CLARENCE D. SELBY (Resident Lecturer in Industrial Health) and the Course Coordinator was DR. JOHN M. LYNCH (Non-Resident Lecturer in Industrial Health) formerly with the Michigan Department of Health and now Medical Director of the new General Motors Corporation Technical Center in Warren, Michigan.

The objectives of the Course in Industrial Health were established to:

1. Provide sufficient opportunity for the student to recognize the responsibility and value of the general practitioner in promoting and maintaining the health of the working population; and to enable the student to acquire enough knowledge on which to base an intelligent attitude toward industrial health in its broadest preventive medical aspects.

2. Create an awareness in the student that his patient does have an occupation, and that this occupation may have an important bearing, directly or indirectly, on his illness regardless of its origin.

2. Furnish adequate material for the student to understand that a relationship exists between the socio-economic status of his patient, always a factor in any illness, and his occupation; and that his patient's treatment should never be considered complete until his earning capacity is restored.

4. To acquaint the student with the common and important environmental health hazards which exist in industry; along with the pathological changes they may produce, and the medical and engineering methods for their control.

5. Afford an opportunity for the student to evaluate occupational medicine as a possible field in medicine in which he may wish to specialize—either in a part-time or full-time capacity.

The period of instruction from February through June embraced the following subjects, presented by practitioners well known in occupational medicine:

Occupational Diseases—J. M. LYNCH, M.D.

Medical Services in Industry—WILLIAM FULTON, M.D.

Heart Disease in Industry—J. BIELAWSKI, M.D.

Employability and Job Placement—E. A. IRVIN, M.D.

The Handling of Personality Problems—MARION JOCZ, M.D.

Retirement Problems of the Older Age Group—EARL LUTZ, M.D.

Restoration of Earning Capacity Following Illness and Injury—HARLEY KRIEGER, M.D.

Workmen's Compensation—THEODORE RYAN, LL.B.

Physical Factors in the Worker's Environment—W. G. FREDRICK, SC.D.

Industry's Contribution to Disease Etiologies—CAREY P. MCCORD, M.D.

Industrial Hygiene Engineering Surveys, Studies, and Controls—J. C. SOET, M.CH.E.

The Pneumoconioses—W. L. BROSIOUS, M.D.; C. C. BIRKELO, M.D.

The Future for Industrial Health—C. D. SELBY, M.D.

Of particular interest on the evening of May 5, was a tour of the Pontiac Motors Division, General Motors Corporation, Pontiac, Michigan, during which the students had an excellent opportunity to see a comprehensive industrial health program function at the plant level. The medical facilities and the final auto assembly line were visited, and the Corporation provided not only the bus transportation from Ann Arbor but the evening dinner as well.

IN SUMMARIZING the course at the last lecture DR. SELBY stated that he believed firmly in the future and security of industrial medicine in view of the rapid strides now being made by industrial health education and research. He predicted continued progress for industrial medicine only as long as the importance of these two elements is recognized.

The Re-Employability of Persons Released from Mental Institutions

ROLAND P. MACKAY, M.D.,
Chicago

THE RE-EMPLOYABILITY of persons released from mental institutions is a problem of great psychiatric, industrial, and human interest. The well known and almost universal reluctance to employ such persons is a relic of the ancient days when any patient in a mental institution was, *ipso facto*, hopelessly and permanently insane. Today, of course, our best general hospitals have psychiatric units, private sanitaria dot the landscape, and state hospitals are available to all, not simply for the custodial care of maniacs, but for the scientific treatment of mental disorders in their incipient stages, when cures are regularly achieved. Furthermore, the introduction of modern methods of therapy has placed psychiatric disorders among the most curable of illnesses, and the public is gradually learning to seek psychiatric help for disturbances which they formerly bore in silence until spontaneous recovery came or hope had to be abandoned. So good are the results of modern psychiatric treatment that an appropriate inscription to be placed above the portals of any good mental hospital might well be "Lift up your hearts, all ye who enter here!"

To cling, therefore, to our old prejudices against accepting discharged patients in our offices and factories now denies to psychiatry the just reward of its achievements, robs industry of much of its best manpower, and works a grievous injustice upon recovered patients who sorely need full acceptance for their continued health. We physicians especially need to recognize these facts, in order to do fairly by ourselves, our patients, and our community.

This is not to imply that *all* discharged patients are re-employable. In the worst cases the incurable patients remain within institutions for custodial care. A discharged patient is, therefore, probably employable, provided the conditions of work do not tend to produce a recurrence in his individual case, and provided no deterioration of ability has occurred. A certain number discharged may not be able to do more than remain at home, while others, not able to return to their original jobs, can do less exacting or burdensome work. We owe ourselves and our patients, therefore, a careful study of the various types of mental illness and the criteria of re-employability, so that judgment may be exercised in all cases.

Unfortunately, no reliable statistics are available as to what percent of our patients we may expect to send back to work. Follow-up studies are especially difficult in this type of illness: discharged patients seek anonymity; those relapsing often change institutions; improving methods of treatment often make last year's statistics obsolete. Furthermore, generalization is perhaps less possible in psychiatry than in any other field of science. Only a little experience suffices to teach the psychiatrist how unique each individual is, how complex are the factors underlying mental health, and how cautious one must be in prognosis. We are, therefore, forced to rely on our experience with the various types of mental illness, the degree to which they may end in recovery, the tendencies to recurrence, and the suitability of different types of work for discharged patients. Above all, we must remember that a separate opinion must always be given for each case.

The heart of our problem here is, of course, the question of recurrences. In a given case, is a recurrence likely, and, if so, after how long a time? As we shall see, recurrences are quite probable in cases of manic-depressive psychosis, although they may be very long in coming, while the patient is perfectly normal between attacks. Some types of mental illness, such as general paresis, once relieved by adequate treatment, practically never recur. In general, the possibility of recurrences in mental disease is not greater than it is in heart disease, infections, or many other types of illness.

The Organic Psychoses

BY THE TERM "organic psychoses" we understand those in which the mental symptoms result from some organic, i.e., structural, metabolic or chemical, group of changes in the brain. There are many which might be discussed in this category, but we shall restrict ourselves to general paresis and the post-traumatic and alcoholic psychoses. Mental changes due to Alzheimer's and Pick's diseases and those due to brain tumor are not included, since they scarcely ever permit re-employment. The same is true of the senile psychoses, but it must be remembered that many older patients may seem to have senile psychoses when actually they suffer from schizoid or affective disorders such as involutional melancholia, from which they may recover under treatment, and have years of useful normality remaining. The diagnosis is highly important in these instances, since depressions in older patients may resemble senile deterioration and mislead the physician to withhold treatment which could restore them to normal life. Organic psychoses due to general medical diseases, such as those seen sometimes in thyrotoxicosis or the confusional and delirioid states secondary to in-

From the Department of Neurology and Neurological Surgery, University of Illinois College of Medicine, and St. Luke's Hospital; presented at the Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, April 26, 1950.

fection, malnutrition, or exhaustion are also omitted, since upon recovery little doubt exists as to the employability of the patient.

GENERAL PARESIS. Among the organic psychoses, general paresis is perhaps the classical example. This syphilitic disease of the brain was once a uniformly fatal affliction, and the one which, perhaps as much as any other, caused mental illness to be thought incurable. Formerly much more common than today, when more adequate treatment of early syphilis prevents its frequent occurrence, it became curable in the majority of cases with the introduction of artificial fever therapy. The advent of treatment with large amounts of penicillin—10 million units or more, given within three weeks— has apparently further reduced its threat, though as yet fever is indispensable and best combined with penicillin.

For our immediate purposes the important fact is that about two-thirds of general paretics can be returned to useful employment with modern therapeutic methods. Half of these can be returned to their previous positions, and the other half to less exacting work, without fear of relapse if the follow-up treatment is adequate and serologic and spinal fluid control closely followed. The last third includes fatal cases and those incurable in greater or lesser degree, and hence unemployable, even if they achieve discharge from the hospital.

Industry may, therefore, safely re-employ paretics who have been adequately and successfully treated by modern methods, but the complexity of the work they can be expected to perform will depend on several factors—the promptness with which the disease was detected, the degree of freedom of the patient from paralyses and other objective neurologic abnormalities, and the thoroughness with which follow-up observation is carried out. The employer will be naturally dependent upon the neurologist for an appraisal of these factors in individual cases.

THE POST-TRAUMATIC PYSCHOSES. The post-traumatic psychiatric states include a bewildering variety of behavior disturbances, ranging from the milder anxiety neuroses, usually associated with postural vertigo and headache, through the intermediate states of irritability and emotional instability, to the severe, true post-traumatic psychoses with dementia, manic reactions, rages, panics, or schizoid behavior. The milder disturbances do not concern us here; we are interested in those patients whose aberrations are severe enough to bring about their institutionalization. Some of these may be considered "purely" post-traumatic, in which the symptoms result from trauma alone, while others represent "activation" of pre-traumatic psychotic trends, never before overtly manifest.

To render a prognosis as to the re-employability of such patients as a group is impossible. One can only insist on individualization, and a decision in each case on its own merits. In general, however, those patients with severe head injury and considerable dementia are apt to be poor risks and not again employable. Others, with injuries elsewhere than to the head and without dementia, but with previously sub-clinical psychic disorders, merely activated by the emotional insult of the trauma, are more apt to be restored to normality by suitable institutional and psychotherapy. Such individuals respond to treatment just as do those who become psychotic without precipitating trauma. They are the schizoid individuals and psychoneurotics who managed fairly well before the injury, and who recover and manage fairly well again. They are largely re-employable—perhaps two-thirds of them. Again, one can only rely upon careful psychiatric appraisal in each case. The criteria for such re-employability are, roughly, the achievement of insight, the disappearance of delusional formulations and projection mechanisms, and the acquiring of objectivity and a valid sense of reality without undue preoccupation with the self (ego). Again the employing or personnel officer can not judge of such matters. He must have the close advice and assistance of the psychiatrist, and, if possible, the psychiatrist who has himself treated the patient and followed his progress.

THE ALCOHOLIC PSYCHOSES. It is convenient to divide the alcoholic psychoses into those which are transient and those which are persistent. To consider the latter first, we recognize Korsakoff's psychosis as well as a large group of conditions which we may call alcoholic deterioration. It is not necessary to describe here these two types of disorder, the first well defined and rather easily recognized and the second heterogeneous and indefinite, because they are persistent, as a rule, and progressive. It is scarcely ever wise to re-employ one of these patients, even if he should chance to be discharged from an institution.

More needs to be said of the transient alcoholic psychoses, delirium tremens and acute alcoholic hallucinosis. True, these conditions, under proper treatment, clear up, leaving the patient relatively as well as before, and able to carry on his previous work. It is necessary, however, to remember the nature of alcoholism to understand that, though recovered from a single episode, the patient is almost certain to continue his debauchery and lapse again into a similar state. The alcoholic is usually a peculiarly affable and personable fellow, whom one would be glad to assist by placing him again at his job, especially in view of his insistent promises to renounce forever his drinking. One would be glad, indeed, except that one knows better than to believe him. Granted that a few alcoholics truly reform, that under the aegis of the Alcoholics Anonymous organization a few remain true to their promises, one must admit that the vast majority continue on in their ways to relapse again into psychosis and incapacity. No doubt there will always be some exceptions, in whose case one can only give the patient the benefit of the doubt, but it would be a false generalization to call these typical.

The key to the problem is, once more, individualization, based on careful psychiatric study and on a period of probation. But these exceptions will be few, for the alcoholic who has gone so far as to become psychotic and need institutional care is seldom to be trusted to keep his own resolutions. One factor will be of help: certain occupations—e.g., salesmanship, journalism, promotion—require or involve such a brand of sociability and good-fellowship that they scarcely permit complete and permanent abstinence; while other types of work, demanding less of the "glad hand," permitting more sober and solitary work, are more apt to aid the abstainer. Even these jobs offer little help to the unfortunate solitary (and hence more psychopathic) drinker. Thus, not only must there be some study of the individual patient, but the work to which he returns must be appraised for its suitability.

What has been said about the alcoholic applies even more strongly to the patient addicted to drugs. A good deal of more or less innocent addiction to sedatives exists, as we all know, but if these drugs are taken to the point at which institutionalization becomes necessary, the question of re-employability after discharge must nearly always be answered in the negative.

The "Functional" Mental Disorders

BY "FUNCTIONAL" disorders is meant those for which no organic cause is known. They include the schizophrenic and affective psychoses and the psychoneuroses. There has long been a deep suspicion that the schizophrenic states represent more than a reaction pattern—that at least the more severe ones result from some organic, though probably very subtle, physical disorder. Similarly the hereditary incidence of the manic-depressive psychoses leaves little doubt that a constitutional, and hence organic, basis in some way underlies their origin. Yet, for convenience we may call them "functional" disturbances to distinguish them from those related to known physical factors.

MANIC-DEPRESSIVE PSYCHOSES. Those persons who are subject to recurring attacks of depression or euphoric excitement and in whose family histories similar cases are recorded constitute one of the most fascinating groups within the purview of the psychiatrist. They may be and usually are perfectly normal when not the victims of their attacks; they become depressed or euphoric without detectable reasons; their attacks run a self-limited course, which lasts from a mere few weeks to months or even years, and they recover their health even if not treated, without evident reason. It is one of the greatest achievements of shock therapy that by its use these patients may be restored to health promptly and thus may be spared long months of suffering and psychosis. The lives of many are certainly saved by their restoration before suicide occurs.

When so restored, such persons are immediately re-employable. They work as well as ever they did before, and to refuse to put them back on their job after recovery is to do a great injustice to them and to rob industry of their services. But the danger of recurrences is never eliminated, and is not avoided by shock treatment. Often recurrences appear in a given case after a fairly constant interval—e.g., after one, or two, or five years, as may be characteristic of the case in question. In a few unfortunate individuals, recurrences appear so soon as to make re-employment impracticable—there is little difficulty, however, in recognizing such cases. Many patients, subject to this cyclic type of disorder themselves detect the earliest symptoms of a relapse and willingly ask for treatment, which, applied early, may abort depressions before they are fairly established.

Thus the manic-depressive patients, and especially those more numerous ones who are subject only to depressions and never to manias, are almost uniformly re-employable after discharge. Those whose manic episodes are mild—and this includes a large number—are often the most energetic workmen, salesmen, or administrators, with unusual productivity and value to their employers. But again, the advice, and counsel of the psychiatrist must be utilized in reaching the decision when to re-instate these patients in their jobs.

INVOLUTIONAL MELANCHOLIAS. It is a popular idea that the "change of life" often induces mental breakdown. There is more basis in folk lore than in scientific psychiatry for this conception. In the case of women, scarcely does the young girl begin her regular menstrual cycle before an inevitable and grimly ominous menopause is invoked to explain every passing symptom. Often the physician, baffled by obscure syndromes, falls back upon the "change of life" as an explanation. Even in the case of the male, a corresponding "change of life" is often supposed to explain strange symptoms. Perhaps there is some basis of fact for these suppositions, especially in women, but it is the author's belief that the emotionally disturbing prospect of failing powers and lessening skills, of diminishing personal effectiveness and vanishing sexual appeal and potency, is more often the basis for these "involutional" disturbances than are physiological changes. The folklore itself is a patent psychogenic factor in the symptoms of late middle age.

Whatever the etiologic mechanism, psychotic manifestations often appear for the first time at or after the age of 50. These are usually some variety of depression, and are called in that case the "involutional melancholias." They respond to treatment somewhat less readily than the depressions appearing earlier in life. When they do respond satisfactorily, the patients are more apt to have recurrences than are younger patients, and the frequent advent of early senile intellectual deterioration further impairs the prognosis.

The re-employability of such patients is less

obvious and certain than that of other depressed patients. But even here, the extraordinary biologic tendency to recovery often surprises us, and leaves us without sound basis for relegating such patients to the scrap heap. Again, the only sure test is by trial. If the psychiatrist finds little evidence of intellectual decay, and can assure himself that the depression has been removed, and if the patient remains well for a month after treatment is over, re-employment is wise.

THE SCHIZOPHRENIC PSYCHOSES. The schizophrenias constitute the largest group of the psychoses. Once called dementia praecox by the great Kraeplin, their extraordinary variety of clinical form and of prognostic outlook has become more and more recognized. Once thought, as a "dementia," to be uniformly irremediable and hopeless, we now know that the great majority of cases are transient, at least with the help of modern therapy. No doubt we shall one day know how to recognize the hopelessly progressive cases, and separate them from the milder forms of schizoid reaction which respond to modern therapy in so miraculous a fashion. At present the surest method of separating the progressive from the transient forms is by the therapeutic test—which is good enough for our purposes.

Who are the schizophrenics? They are those persons who, when afflicted by their illness, develop an inner psychic world of their own, constructed out of warped fragments of their experience, to which inner world they adjust rather than to the "outer" world of reality which is common to us all. They interpret the events of their lives in accordance with this inner constellation of ideas, prejudices and preconceptions—they come to hold "queer" ideas: that they have no organs, that they are not themselves, but someone else, that the idle glance of the passerby is hostile spying, that the innocent laughter of a stranger is personal ridicule. They may act in strange and inappropriate ways, carry out bizarre, stereotyped, and apparently symbolic movements, retreat into a shell of immobility and inaccessibility, or attack violently or resist passively those who would communicate with them. No description of these patients and their strange behavior can do justice to their extraordinary variety of thought and act.

The important consideration for us is that the majority of them are persons who, as "normal" as you or I, slip into their psychoses under the stresses of their lives, and may be rescued by skilled treatment.

Since a great proportion of schizophrenic patients exhibit hostile behavior because of their delusions of persecution, or otherwise react in asocial or antisocial ways because of their allegiance to their inner world rather than to reality, they are peculiarly unemployable. Those who are working often first show their psychotic tendencies by a disturbing perversity of behavior or antisocial hostility. They often return to a more nearly normal behavior upon removal to the isolation of the hospital environment, even before radical shock therapy is administered. After adequate treatment, which must also include a unique personal contact by physician and nurses, without any attempt to argue with them about their delusions, but with unfailing sympathy, firmness, objectivity and good humor, they usually exhibit further improvement in an ability to accept the realities of life and to abandon their inner ideas. Restored to normal emotional attitudes, their ability to re-enter their previous environments is the chief criterion of their recovery. Many having achieved a normal attitude toward themselves and toward others, with something approaching a sense of humor, become useful workers. Although relapses may occur, these relapses may be avoided by granting to them normal human relationships in their work. Others are either not restored to health, in which case they cannot be discharged from the institution, or return to their psychoses even during a convalescent period after discharge, and cannot be re-employed.

No generalizations can be made as to which patients or how many patients are acceptable in industry or business. Again the personnel officer must rely on skilled psychiatric advice in each individual case. This means post-therapeutic observation during a period of convalescence before re-employment. The criteria used by the psychiatrist include not only a freedom from ideas of reference, delusions of persecution, and unrealistic reliance upon inner psychologic formulations, but also an ability to retain insight into the pathologic nature of the illness just escaped, and an unmistakable warmth of feeling for others and ability to avoid preoccupation with self.

Such patients may safely be re-employed, not because they may never relapse, but because they make good workers, carry their share of the load, and themselves desperately need to be considered normal, desirable, and successful persons. Their ability to remain normal under difficult industrial or social conditions is the touchstone of their true recovery or "cure."

One criterion may be of considerable help: onset of psychosis early in life may often suggest a poor prognosis and unlikely re-employability. In the same fashion, onset at an advanced age tends to suggest a poor outlook.

PSYCHONEUROTIC MALADJUSTMENTS. By far the commonest psychiatric disorder is psychoneurosis, although it does not lead to hospitalization so often as do the psychoses. There is room for considerable debate as to the etiology and nature of the psychoses, some at least of which result from organic, non-psychologic disorders of the nervous system. But there is little doubt that the psychoneuroses are psychic in their origin. That is to say, they result from emotional conflicts, early and inappropriate allegiances to father, mother or chance associate, old habits of looking at difficulty through the

eyes of fear or hostility, and childish and ineffective technics of living. The psychoneuroses may be classified in many ways according to their fundamental mechanisms, or their symptomatology, but they all result from childish methods of dealing with an adult's world. They, therefore, represent a failure of the training of the young in the ways of maturity and self-reliance.

The more severe psychoneuroses—and it is to be emphasized that none of us is utterly free of neurotic traits—may incapacitate the individual for work or bring about his institutionalization. Under treatment by protection, isolation, and education to see himself objectively and understand and remedy his inadequacies, which is psychotherapy, the psychoneurotic may achieve maturity and become once more employable. So incorrigibly healing are the biological forces of the individual that many achieve recovery without formal treatment.

To refuse to re-employ such recovered patients is to follow a policy of self-defeating perfectionism. But one cannot generalize—again the employer must rely upon the psychiatrist's prognosis, which, in turn must be based on the careful study of the individual patient.

In fact, it must never be forgotten that certain neurotic patients are the best of possible employees. Some of the compulsive patients, the perfectionists, the stubbornly tenacious, the neurotically loyal, make the ideal worker in office, shop or factory. It is such people who keep the wheels of the world moving and who actually earn the profit of the employer.

IN SUMMARY, then, having considered the representative psychoses as well as the psychoneuroses, we come to a realization that often the patient with a "mental history" must, for the employer's good as well as his own, be returned to his job as soon as feasible. In a number of cases this will not be wise or possible. It is rarely possible to generalize about the selection of those persons who can or should be put again to work. Throughout this whole discussion runs the constant thought that every case must be considered upon its own merits, and that skilled and painstaking study by the psychiatrist must be utilized in making the decision. The psychiatrist whose opinion is most valuable in this process is the one who has treated the patient during his illness, and who, therefore, is most familiar with his personality and can give the most accurate prognosis.

(8 South Michigan Ave.)

Alcohol Myths

SOME alcoholic myths culled from the University of Wisconsin summer session of alcohol studies: *That alcohol warms you.* (You actually shed body heat. The blood vessels near the surface of the skin lose warmth). *That alcoholics are addle-brained.* (More often than not, they have a good I.Q. rating.) *That alcohol injures germ plasm and has an evil hereditary influence.* (No scientific evidence of it. Children of alcoholics sometimes turn to drink because of environmental influences.) *That alcohol is an aid to great work.* (Artists, contrary to some popular belief, produce their great works during sober periods.) *That alcohol produces cirrhosis of the liver.* (While shrinking and hardening of the liver is more common among heavy drinkers, it also occurs among nondrinkers. Lack of proper nourishment is believed responsible.) *That only those who drink hard liquor are alcoholics.* (Many an alcoholic has gone on the rocks because he insisted he could drink beer, even though convinced he couldn't handle whiskey.) *That not mixing one's drinks will prevent a hangover.* (The body doesn't know a dry martini from an old fashioned. Liquor is ethyl alcohol in any form.) *That alcohol (1) causes hardening of the arteries; (2) prevents it.* (There is no scientific evidence to support either assertion.) *That alcohol causes ulcers.* (Misconception arises out of the fact that alcohol used over long periods may inflame stomach and intestines. Because a drink taken on an empty stomach may increase flow of stomach juices, alcohol is forbidden to the ulcer victim.) *That alcohol is a medicine.* (Not in the sense that it can cure colds and burn out pneumonia.) *That alcohol is a stimulant.* (The exhilaration a drinker feels after a few drinks is only an illusion. His discrimination and self-consciousness are removed. Alcohol is a depressant classed with ether.) *That alcohol is a food.* (Not in strict definition of food. While it has calories, it has no minerals or vitamins, fats, or protein. It cannot repair body cells. It cannot be stored. It is never digested. It is absorbed into the blood stream.) *That alcohol corrodes the brain.* (It only slows the brain functions by its numbing and drugging action.) *That alcoholics like to drink in convivial crowds and gay atmospheres.* (Alcoholics like to drink with a fellow alcoholic or alone. Almost never with the opposite sex.) *That alcohol shortens life expectancy.* (No difference found between moderate drinkers and abstainers. Addicts, however, are less resistant to disease and die earlier.)

—ARTHUR J. SNYDER, in *Chicago Daily News*, August 24, 1950.

The Painful Shoulder

JAMES K. STACK, M.D., F.A.C.S.,
Chicago

IN GENERAL, persons with a painful shoulder can be classed in two principal groups: those who have been injured, and those in whom there is no reasonable history of injury.

The injured group can be subdivided into those who have fractures, and those who have not.

The group having fractures can be further subdivided into those that require reduction, and those that do not.

Let us first take up those fractures of the humerus in the region of the shoulder that do not require reduction. This is a common situation, particularly in the older age groups. Then, these can be subdivided again into those that need immobilization and those that do not. We must first realize that there is no direct ratio between the anatomic position of an impacted fracture and the expected function. Substantial deformity can be present in and around the head and neck of the humerus without significant restriction of motion in the humeroscapular joint. The reason for this is, of course, that the shoulder is a lax joint with a greater range of motion than any other, and in much of its functional range it is not in contact with the glenoid cavity of the humerus. Bony deformity in the upper humerus, unless extreme, will usually play but a small role in any residual dysfunction of the shoulder. Therefore, the average impacted fracture need not be reduced and it should not be immobilized for any period of time, certainly not beyond the acute stage.

It is a sound practice to place such an arm in a sling with a small folded pillow or abdominal pad in the axilla and apply ice bags during the first 24 hours. The application of cold will have a numbing effect and will decrease the pain. It will also, by constricting the blood vessels, lessen hemorrhage, and thereby minimize the tissue reaction that is bound to occur. After this 24-hour period (24 hours is an arbitrary figure; maybe it will have to be 36 or 48), heat in the form of wet packs will hasten the absorption of the blood that is present and increase the number of leukocytes available to take away the products of the injury. Motion should be started as early as the patient can tolerate it, and those who are timid and apprehensive should be encouraged to move the shoulder in spite of the discomfort it causes. The first motion should consist of circumduction of the arm by having the patient lean forward or lean toward the affected side with or without a sling, thus permitting gravity to take the arm away from the body, and in effect, put it into a position of flexion or abduction. With the help of gravity, the patient is then able actively to circumduct, using his own muscle power to do so. The range of active circumduction can be increased as days go on, and this can be followed by gentle passive motions, particularly abduction and external rotation.

Soon the tissues of the shoulder will tolerate light massage following the hot wet packs, and this will further stimulate the absorption of noxious elements and lessen muscle spasm. Such treatment as the hot packs, active and passive motion, and gentle massage should be continued up to the point where the x-ray shows that displacement could not be produced by more strenuous forms of exercise. The result desired is to have the patient have a range of motion that is nearly normal by the time bony healing has occurred. Certainly there is no worse treatment in an impacted fracture of the upper humerus than prolonged immobilization of the arm to the chest wall. Severe permanent restriction of motion can be expected following any such method.

There are other instances of fracture through the surgical neck of the humerus in which impaction is not present, yet will not require rigid immobilization. It should be remembered that the weight of the dependent arm itself plays a part in the stabilization of these fractures, and the long tendon of the biceps intact in the bicipital groove will also aid in the maintenance of contact by its attachment above and below the fracture site. Addition of a hanging arm cast may be considered as an adjunct in the non-impacted fractures, but this should not interfere with the early restoration of active motion. In those who have the fracture which is not impacted, more care will have to be exercised in guiding their early motion. The hot packs should be given, as in the case of the impacted type, and the light massage may be used, but active motion should be relied upon for a longer period before passive motion is started.

THE other common fracture of the upper humerus, which will require the decision whether to reduce and whether to immobilize, is the avulsion fracture of the greater tuberosity. This fracture commonly occurs in association with fractures through the surgical neck, and also with dislocation of the humeroscapular joint when the dislocation occurs for the first time and with substantial violence as a cause. Frequently, the avulsion of the tuberosity will not be complete, and if this is the case, no immobilization will be required and treatment will follow the exact lines suggested for the fractures of the surgical neck of the humerus. However, in

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some there will be no complete separation, and as time goes on, the muscles attached to this part may actually draw it upward and medialward to a point beneath the acromion process.

In fractures of the greater tuberosity with displacement, one must make the decision whether to immobilize the arm in a position of 90° of abduction and 90° of external rotation in order to bring the humerus to the fragment, or whether an open operation should be done, the tuberosity fragment re-attached to the humerus surgically, and then early motion instituted. It is our feeling that with any tuberosity that is separated to the point where prolonged immobilization is necessary for apposition and healing an open operation should be done and the patient given the advantage of early movement of the shoulder. The postoperative care following the re-attachment of the tuberosity does not differ from that suggested previously for the other types of fractures.

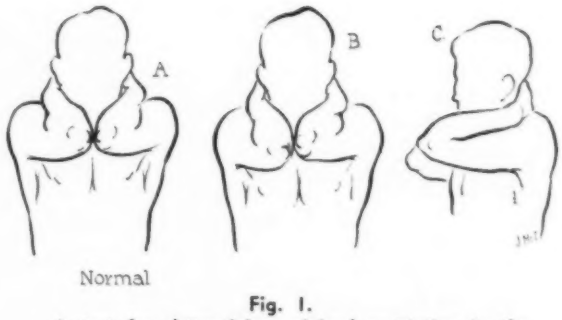

Fig. 1.

A test for determining minimal restriction in the humeroscapular joint. The fingers are locked behind the neck and the patient is then asked to attempt to appose his elbows by bringing them forward. This places the shoulders in a position of flexion and abduction. Where restriction is present the tip of the elbow on the affected side will be farther forward then that on the unaffected side. In other words, the flexion abduction length of the arm will be increased (B and C)

PERHAPS the largest group of patients with painful shoulder will be those in whom no fracture can be demonstrated, and the differential diagnosis will usually have to be made without significant help from the x-ray. In this group, the history of an injury is important. The injury does not have to be particularly violent, as tears in the rotator cuff and biceps tendon can take place with minimal trauma.

The rotator cuff of the shoulder is the term given to the tendons of the supraspinatus, infraspinatus, teres minor, and subscapularis muscles as they insert on the head of the humerus in and around the greater and lesser tuberosities. The principal function of these muscles is by their contraction to set the head of the humerus snugly against the glenoid cavity to provide a fulcrum on which the motion of abduction of the arm can take place. Because of their point of insertion they can offer little help in the actual abduction movement, though the former three do play a role in external rotation and the latter one in internal rotation. Tears of this cuff may be complete or incomplete, parallel to or at right angles to the fibers of the tendons.

In the complete tears, the patient will present a completely disabled shoulder, and in the early phase it will be impossible to make an adequate examination because of the generalized pain, swelling, and tenderness about the joint. In this regard it is similar to the situation that exists in the knee. Here too, it is virtually impossible to make an exact diagnosis of the tissue involved when the patient presents a greatly swollen and generally painful joint. After several days of sling immobilization, hot packs, and the like, a satisfactory examination of the shoulder can usually be carried out. In the absence of fracture, our first consideration is given to the localization of a possible tear in the rotator cuff, and an attempt is made to determine its extent. It is convenient when visualizing the possible lesion in a shoulder of this kind to divide the cuff into segments, as suggested by MacLaughlin. These segments are superior, posterior, and anterior. The superior segment consists of the tendons of the supraspinatus muscle; the posterior segment of the tendons of the infraspinatus and teres minor; and the anterior segment consists of the subscapularis. Each segment is tested for individual function and this is done by rotating the humerus so that each segment in turn will assume the superior position. For instance, the supraspinatus occupies the superior position when the arm is in a neutral rotatory position. The posterior segments are in the superior position when the arm is internally rotated, and the anterior segment is in the superior position when the arm is externally rotated. The integrity, then, of each segment is tested by its ability, first, to initiate abduction when it is in the superior position, and, second, to maintain abduction against moderate resistance. This places on each of the segments a greater functional demand, and they must be intact in order to carry out the dual assignments of motion and maintenance of position. In this way, it can be determined with reasonable accuracy whether any single segment is ruptured sufficiently to necessitate open repair or whether the entire cuff is torn, making an attempt at open repair mandatory.

Such tears as these are usually the result of indirect violence to the shoulder. At the time of the open operation on such a shoulder it will be noted that these torn tendons do not consist entirely of normal tissue. In the repair of the segmental tears, those that have occurred at right angles to the direction of the tendon fibers will have to be closed in such a way that the suture line is parallel to the remaining fibers. The quality of the tendon tissue is not adequate to hold in any other way, and in no other way is it possible to repair this tendon segment

without tension. The absence of tension is the first requisite of a successful result in surgery of this kind. Prior to the actual suture of the rent, the edges are freshened, and tendon tissue from the torn edge is obtained for microscopic study. Under the microscope it will be seen that much of its collagen content has been lost, and various stages of fibrous, fatty, or xanthomatous degeneration will be noted. A substantial disruption of part or all of the rotator cuff with minimal trauma is explained by such a microscopic picture. It might be mentioned here that other ruptured tendons, such as the biceps, the Achilles, the quadriceps, etc., are usually also in varying degenerative states at the time the repair is done.

Now, what of those patients who have sustained minimal trauma, or none at all, who still have a painful shoulder with little or no restriction of motion, and who pass the segmental motion and maintenance tests well? This is the group in which, with negative x-rays, the diagnosis of bursitis is commonly made. This diagnosis is not altogether accurate and can be compared with the diagnosis of low back pain or internal derangement of the knee, neither of which localizes the tissue involved or the point of involvement. Aside from certain rheumatic states and perhaps gout, bursitis is not a primary condition. The real lesion is in the tendon cuff, which is immediately subjacent to the floor of the bursa. The lesion is essentially one of attrition. Minute ruptures of the tendon fibers take place over a period of time in response to the wear and tear of life during which the shoulder is put through paces and impingements beyond that of any other joint. Such minute lesions, if superficial enough, that is, if taking place in the cephalad portion of the tendon, can then irritate the floor of the bursa and provoke an effusion within it. This can cause such tension as to make the clinical picture a very painful and frightening one for the victim. If the lesion is not rough enough to cause such a dramatic response, it can produce just enough irritation to make the patient aware of some discomfort in the shoulder and upper arm, particularly in the extreme ranges of rotation and abduction. There will be no constant point of local tenderness, there will be no or only slight limitation of motion, no atrophy; in short, nothing in the way of objective findings upon which one can base a diagnosis. The diagnosis really is made by ruling out other things that could account for such symptoms and relying on what we know by experience takes place within these joints.

Such a minute lesion of attrition is the forerunner of the calcific deposit seen so frequently in x-rays of the shoulder (Fig. 2). It is frequently said that this deposit lies in the subacromial bursa, but this is not true. The uncomplicated deposit lies within the tendon substance in any of the segments of the rotator cuff, usually the supraspinatus and the anterior fibers of the infraspinatus. It is only when the deposit actually ruptures through the floor of the bursa that a diagnosis of calcific bursitis can be made. Calcific tendinitis is the correct diagnosis in the usual instance of this kind. Why is it then, in the routine x-rays of chests, for instance, or the x-ray of the shoulder taken for possible fracture, that sometimes relatively large depositions of calcium will be seen and yet the patient will be totally unaware of their presence? On close questioning of such a patient, one can usually bring out the history of vague, intermittent, non-disabling shoulder pain, which suggests that the minute lesions of attrition have preceded the depositions of the calcium. The presence or absence of disabling symptoms will depend on the position of the calcification in the tendon and its relationship to the floor of the bursa. As long as the calcium lies deep and inert, there may be no symptoms, but when other factors enter the picture to produce an edema in the tissues surrounding the deposit, pain will then become evident and may be severe. This explains the fact that a patient may give a history of a painfully disabling shoulder for the past five days and yet the x-ray will show a calcific deposit so mature that you know it has been there for months or years. It alone can not be the reason for the

Fig. 2.
Calcific deposit within the substance of the rotator cuff of the shoulder. The darker elements in this mass represent more mature calcification than the lighter elements around the periphery of the mass. The presence of this degenerative change antedates by months or years the onset of symptoms in the shoulder. Note the generally healthy appearance of the other bone and joint structures shown

symptoms. There must be a provoking event or condition.

IN THE treatment of these tendon lesions, such as incomplete segmental ruptures not requiring open operation, minute lesions of attrition, and calcific tendinitis, it is safe to say that practically all of these people will get over the acute phase and many of them over the chronic phase without much help from the doctor. However, this will probably be a long and painful process and there are many things we can do to expedite their recovery.

It should be said that any treatment is difficult to evaluate because the patient might have recovered anyway.

The first of these treatment methods, and the simplest, is similar to the treatment outlined in the direction of the impacted fracture of the surgical neck of the humerus, that is, rest in a position of mild abduction and neutral rotation and heat in the form of hot, wet packs. Analgesic drugs may be used during this period.

Heat in the form of diathermy and the counter-irritation generated by exposure to x-ray have their advocates.

The "needling" operation is a conservative measure which will bring about relief and eventual recovery in a high percentage of these patients. This "needling" is not just an injection of novocain into a painful area. The novocain is used only to provide the anesthetic in order to get the needle point where it is wanted. The purpose of the "needling" is, first, the relief of tension if the bursa is distended by fluid, calcium, or both; second, to disperse the edema in the tendon tissue surrounding the calcium; third, to disperse somewhat the calcium itself, with the thought that this will hasten its absorption; and, fourth, to induce by multiple punctures of the involved tissue a hyperemia which will transform this indolent area into one in which an active healing process can take place.

Finally, there are those who advocate the open operation on the shoulder, exposure of the cuff, and removal of as much of the calcific deposit as possible. The x-ray picture is deceptive. One might think that the shadow represented a discrete, circumscribed mass which could be picked out or enucleated. However, the calcium deposit is intimately associated in and between the tendon fibers and usually must be scooped or curetted out. It may be the consistency of tooth paste in the relatively fresh deposit or when the area around is edematous, or it may be relatively firm in the older, more chronic states.

After either the needling or the open operation, a period of physical therapy will be necessary in both instances to overcome the limitation of motion that is invariably present. We have reserved the open procedure on calcific tendinitis for those whose condition is intractable to the simpler and more conservative methods.

Rupture of the long tendon of the biceps muscle and the degenerative changes that precede rupture should not be excluded in the differential diagnosis of the painful shoulder. The tendon may be completely torn from its origin on the superior lip of the glenoid or disrupted at the upper level of the bicipital groove as it passes over the supratubercular ridge, which may be quite sharp. It may remain intact but be frayed out, and thus by friction set up a bicipital tenosynovitis. Pain and tenderness will usually be more anterior than in the rotator cuff tear and will be accentuated by supination against resistance, flexion of the elbow against resistance, and abduction and extension of the shoulder with the humerus internally rotated and the elbow straight. The typical contour of the biceps muscle is diagnostic of the complete tendon rupture, but this contour may also be present if the tendon is frayed and elongated so that it can not get sufficient purchase on the muscle to contract it normally.

Hitchcock and Bechtol, in a discussion of this problem, emphasize the fact that the humerus moves on the fixed tendon. They review Meyer's work on "Lesions of Attrition About the Shoulder," and state that 17% of the specimens examined had supratubercular ridges responsible for this wearing away process. In 8% the bicipital groove was too shallow to give adequate guidance and support to the tendon and accounted for chronic peritendinitis and partial or complete tendon dislocations. If the tendon is adherent to the bicipital groove, a buckling of the proximal portion within the joint may account for shoulder symptoms.

The surgical management of such lesions consists of the removal of the proximal portion of the tendon from its origin on the superior lip of the glenoid and by fixation of the distal portion of the tendon to the bone in the bicipital groove, or if enough tendon length is available, it may be attached to the coracoid process. In this way, both the long and short heads will then originate from the same point.

MUCH shoulder disability following injury can be prevented, or certainly lessened, by accurate diagnosis of the tissues involved and the extent of involvement. We should choose wherever possible treatment methods which will permit early motion and thus avoid the development of generalized adhesive capsulitis. The shoulder disability which occurs without injury can be lessened if the joint is kept moving and treated by those palliative measures outlined. Time is on the side of the patient and not against him, and is perhaps one of the most important factors in recovery.

(700 North Michigan Ave.)

Quantitative Patterns in Industrial Medicine

HARRY B. BURR,
Business Manager and Statistician,
Chrysler Corporation Medical Departments,
Detroit, Michigan

IN THE contemporary practice of industrial medicine there is usually experienced a fairly fixed pattern of demand for professional service. Both the number and character of medical department visits tend to remain constant from period to period.

This stability in medical service demand is generally interpreted as reflecting the fact that conventional techniques employed in preventing human disability have reached their effective limits. It follows that the current need is to press the attack with new tools and techniques and/or along new lines of approach.

Granted this, the direction of future effort becomes of paramount importance. Dealing, as it does, with that complex of variables—man—and the dynamic environment of his modern workshop, the problem is truly formidable. Only as we possess an intimate knowledge of the multiple causation which underlies the disability pattern are we equipped to advance helpful hypotheses.

Accordingly, the present purpose is to assist in the search for the least common denominators of causation which inhere in the repeating patterns of industrial medical treatments—to pinpoint as much as possible, the factors which create the demand for industrial medical service. In furtherance of this end, inquiry has been made into the medical treatment statistics of an automobile manufacturing firm averaging about 85,000 employees during the period 1946-1949, inclusive.

In order to give the observations drawn from these statistics the widest possible application, it is important to note several of the many ways in which this firm qualifies as a sample of a large segment of American manufacturing industry.

In the first place, it includes a range of occupations and a distribution of individuals within that range which are very representative of a great proportion of American manufacturing industry.

Secondly, its more than 20 plants range in size from a worker population of under 500 to over 35,000—with over 75% employing 5,000 or under. These plants are distributed geographically and between metropolitan and sub-metropolitan communities in a manner characteristic of a great part of American manufacturing activity.

Further, its employee population closely approximates the national average for manufacturing industry in respect to age, sex, and color composition.

Lastly here, but not in fact, the company's safety program is generally representative of that existing in the nation's larger manufacturing concerns, although perhaps exceeding the average for smaller establishments.

It may well be concluded that the general characteristics of this study group are such as to establish it as a microcosm for American manufacturing industry at large.

Since the observations made were not the sole product of the characteristics just described, one should examine the die marks on the reverse of the coin—the particular medical program associated with them. To what extent, if any, has it influenced the sample and, hence, the significance of observations drawn from it?

To make full assessment of this medical program is beyond the present scope of this study. Suffice it to comment upon those aspects of the program that bear directly upon medical department treatment or visit incidence figures and which are of current interest.

A MAJOR factor relating to medical department visit frequency is the general level of employee health. That is determined in part by the existence and character of physical examinations, pre-placement and otherwise. In the present case there have existed throughout the study period both pre-employment selective placement and various post-placement examination programs.

The pre-placement examination program is designed for the systematic classification and placement of employees on jobs within their respective physical and functional capacities. It permits the utilization of individuals with handicaps, provided they are placed on jobs not involving those handicaps.

This pre-placement examination disqualifies from employment consideration principally those individuals who have active infections, disabling mental conditions, or convulsive states under inadequate control. Altogether, less than 3% of the total number of pre-placement examinees have been rejected for employment consideration under this program.

There is no evidence to indicate that the low physical examination rejection rate associated with this selective placement program has increased the incidence of medical department treatments or lost-time occupational disabilities.

Post-placement examinations in this company, including post-illness examinations for all employees absent with illness for over five days,

Presented at the Section Meeting on General Manufacturing at the Thirty-Fifth Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, April 25, 1950.

utilize the same physical examination standards employed in the pre-placement examination program. Approximately 1,000, about 5%, of the annual average of 19,000 post-placement examinations result in rejections. Of this number it is estimated that half are temporary and, upon subsequent re-examination, qualify for return to work.

Here again there is no evidence to indicate that, in connection with selective placement, a low rejection rate has increased the incidence of medical department visits or lost-time occupational disabilities.

It can be concluded that in so far as its influence on dispensary-visit and lost-time occupational disability incidence is concerned, this company's examination program is typical of that large segment of American manufacturing industry utilizing physical examination programs.

Several other medical program factors known to influence medical department visit incidence figures are (1) proximity of medical departments to employees, (2) pulchritude and personality of medical department nurses, and (3) medical department policy. Considering these points in the order named, we find that:

In respect to medical department locations, this company has a proximity range in its several plants which compares with the range observed in industry generally.

The company's 90 registered nurses are a well adjusted group as is attested by an increasing service average of now over five years.

MEDICAL POLICY in this company has operated to limit medical visit incidence in two ways. It has required that, except for emergency cases, all employees reporting to the medical department during working hours present a pass bearing a supervisor's signature. This procedure has had little, if any, effect upon limiting occupational disability treatments but has reduced the number of non-occupational or general medical visits. The medical policy further discourages treatment of general medical conditions beyond the point of providing such temporary or emergency relief as is necessary to permit an employee to complete his current work shift and report to his private physician.

Taken together, these two policy provisions have, in the study period, reduced the incidence of general medical visits about 30% and total medical visits about 15%. Since such policies are widely established among the nation's large and medium-sized manufacturing firms, it can be supposed that they place no great restriction upon the application of present observations.

As with the general characteristics of the company, so again with its medical program. Both seem to make the consistent truths and repeating pattern in its medical experience characteristic of industrial medicine over a wide area of American manufacturing activity.

TABLE I.
MEDICAL DEPARTMENT TREATMENTS OF AN AUTOMOBILE MANUFACTURING CONCERN
(Annual Average 1946-1949)

TRAUMATIC: 60% to 67%:
- Eye injuries 15%
- Hand injuries 65%

NON-TRAUMATIC: 40% to 33%:
- Headaches 20%
- Respiratory 40%
- Gastro-intestinal 15%

	Initial Visits	Repeat Visits	Total Visits
Treatments per 10,000 Man Hours	31.5	9.5 (25%)	41.5
Treatments per capita	4.8	1.6 (25%)	6.4

IN PRESENTING the following characteristics of industrial medical activity, it has been the aim to restrict technical details to a minimum. However, it may be noted at this time that the observations are based on large samples and that they vary but slightly from period to period. It is precisely because of these circumstances that they are of significance.

The first series of observations deals with in-plant medical treatments in the study concern during the post war period. Relevant data are presented in Table I.

Of the average annual total of conditions treated (measured by initial visits), 60% were traumatic in nature and 40% were non-traumatic.

In terms of total treatments—initial and re-visits combined—these proportions become 67% for trauma and 33% for non-traumatic disease. In the idiom of our day it may well be said that for industrial medicine "it's trauma 2 to 1."

Of further significance in the injury figures is the fact that 80% of all injuries treated were those of the hand or eye. Eye injuries accounted for 15%, and hand injuries for 65% of total injuries treated. Of the remaining anatomic categories, only arm injuries with 8% of the total were of quantitative significance.

Closely following the injury distribution pattern, about three-quarters of all general medical conditions were contained in three categories. Headaches with 20%, respiratory disease with 40%, and gastro-intestinal disease with 15% together accounted for 75% of all general medical conditions reported to the medical department.

Occupational diseases were quantitatively negligible. Consisting principally of dermatological conditions, this group contained less than 1% of the total treatments administered. However, it is not to be overlooked that one index of severity, that measured by the ratio of revisits to initial visits, was substantially higher for this group than for either the traumatic or general medical sections.

Expressed in relation to man hours worked, the foregoing treatment totals establish that, on the average, there were 41 treatments or medical department visits for each 10,000 man hours of occupational exposure. Of this total, about 75% were for new conditions and 25% were revisits.

Following the previous distribution, 18 injuries and 13 general medical conditions developed for each 10,000 man hours worked. Including revisits, there were 28 injury and 14 general medical treatments—the same "2 to 1" ratio previously noted—for each exposure period.

Although it is less valid as a measure of treatment frequency, per capita incidence is commonly used. On this basis, there were 6.4 medical department visits per employee per year. Of this total an average of 4.8 visits (75%) were for new conditions, and 1.6 visits (25%) were revisits. Per capita, injuries were 2.8, and general medical conditions 2. Including revisits, per capita injury treatments were 4.26, and general medical treatments 2.13.

Any rationale employed in explication of the anatomic distribution of injuries involves two significant factors—relative anatomic exposure and comparative anatomic vulnerability.

In an industrial environment involving a multitude of hand-tended machine operations, the hand and, to a lesser extent, the forearm are the sole members coming in direct contact with the materials being processed and/or employed in processing. In most instances they are those anatomical parts most proximate to the working tool.

Under such circumstances, it is obvious that, groupwise, the hand and lower forearm are considerably more exposed to injury than the remainder of the body and, for this reason alone, most frequently injured.

Although, from a group standpoint, the eye is less exposed to injury than much of the body, its susceptibility to functional impairment is high. For this reason and without further reference to exposure, it may be concluded that eye injuries have reached the proportion above indicated.

These statements are not to be construed as implying that such injuries are inevitable. On the contrary, evidence abounds in proof of the fact that the circumstances facilitating such injuries can, within the plant premises, be minimized through the use of proper protective equipment in a safety program that is strongly and constantly enforced.

Analysis of the two anatomical categories which accounted for 80% of the total injuries is presented in Table II which shows the distribution by type of trauma for both hand and eye injuries.

It is here seen that 80% of all hand injuries and 50% of the total injuries were contained in three hand-injury categories. Together, lacerations, abrasions, and foreign bodies of the hand regularly accounted for half the total injuries treated and, with one exception, were the quantitatively predominant injury categories.

The exception noted is to be found in the distribution of eye injuries:

Foreign bodies of the eye—the vast majority of which were non-embedded—regularly accounted for over 85% of all eye injuries, and 13% of the total injuries treated. Thus, quantitatively, such cases ranked after lacerations and abrasions of the hand, but before foreign bodies of the hand in the list of predominant injury categories.

TABLE II.
INDUSTRIAL INJURIES TO HANDS AND EYES BY TYPE OF TRAUMA, 1946-1949

Type of Trauma	% of Hand Injuries	% of Eye Injuries
Abrasions	29.3*	1.5
Amputations	.1	—
Burns	3.4	5.5
Contusions	6.4	.8
Dislocations	.0	—
Fractures	.2	—
Friction injuries	1.6	1.0
Foreign bodies	15.9*	86.3*
Infections (secondary)	2.4	.8
Lacerations	35.7*	.3
Orthopedic sequelae	.1	—
Puncture wounds	2.5	.0
Sprains and strains	1.5	—
Miscellaneous	.9	3.9
Total	100.0(*80%)	100.0(*86%)
% of all injuries	65.0(*50%)	15.0(*13%)

*Items designated with asterisk comprise sub-totals shown.

The three hand-injury sub-categories previously mentioned and foreign bodies of the eye accounted for almost two-thirds of the total injuries treated by the medical department.

The foregoing observations on in-plant medical treatments deal with total or over-all experience. Actually, such experience has been the product of a combination of many variables—the result of a simultaneous multiple causation. Only as we reduce our observations to these lower terms do we approach practical truths.

IN PREVIOUSLY presenting the study company as a representative sample of a large segment of American manufacturing industry, reference was made to certain typical characteristics which it possessed. In the very mention of these characteristics it is implied that such factors influence industrial medical experience. It is in the analysis of these and similar influences that our observations may be reduced to the lower terms just mentioned.

Again it is beyond present scope to assess the influence of all of the factors which bear upon disability causation and medical visit incidence. However, some attention has already been given to the influence of the medical program on visit incidence, and additional observations can be made in respect to plant size, employee age, job hazards, and individual employee visit frequency.

It is to be noted that there is a definite relationship between the size of plant population and incidence of medical department treatments.

In the present case, the company's over-all 6.4 annual per capita visit incidence resulted from the combination of several plants with less than 1,000 population which averaged 9.5 annual visits per capita; a number of plants with populations between 1,500 and 5,000 which averaged 7.7 anuual visits per capita; other plants with popu-

lations between 6,000 and 10,000 which averaged 5.5 annual visits per capita, and one plant with over 35,000 which approximated the latter rate.

It will readily be seen that, within limits, medical visit incidence varies inversely with plant size in a manner strongly suggesting arithmetical progression.

As a rule of thumb in dealing with medical visit incidence, we may again use the modern idiom to say "it's the small plant 2 to 1." The most apparent explanation of this fact is the "small town atmosphere" and "community spirit" found in the smaller plants.

Comparison of employee age with medical visit frequency reveals that the oldest workers, those over 55, average about a third fewer visits than do the youngest employees, those under 25. The decline in visits between these age group extremes is fairly regular and, although applicable both to injuries and general medical conditions, is mostly due to the latter.

In so far as injury visits are concerned, it is obvious that frequency is necessarily influenced by risk factors inherent in the occupational environment. Length of work period (both daily and weekly), heating and ventilation, lighting, speed of work and plant physical organization (including safety equipment) directly influence injury frequency. Of perhaps greater importance are proximity to moving machinery, and human physical adjustment required for job performance.

IN THE STUDY CONCERN, repeated comparison of mean injury rates among the several occupational groups has shown that, when other factors are approximately equal, injury visit frequency varies as the sum of exposure to moving machinery and physical adjustment required for job performance.

Routinized production operations require relatively little employee adjustment after initial training but frequently involve sustained exposure to moving machinery. Skilled operations largely reverse the two circumstances. They involve relatively less exposure to moving machinery, but frequently require that considerable manipulative talent be exercised.

On this basis it is explained why such skilled occupational groups as job setters, millwrights, and toolmakers frequently have higher mean injury visits than do some groups working with apparently more hazardous production machines. It is also explained why shop supervisors, office workers, and janitors have relatively few injuries.

When all influences on treatment incidence apart from personal characteristics have been considered, there still remains the factor of individual difference in employee medical visit frequency.

Repeated analysis in the study concern and elsewhere shows clearly that under conditions of equal risk, a relatively small proportion (10-25%) of employees accounts for the majority of industrial injuries. Such a result cannot be ascribed to chance alone, and these persons possessing personal qualities which render them more likely than others to sustain accidents are said to be accident prone.

Accident proneness is a narrower term than accident liability, for it refers only to the personal factors tending toward a high accident rate. Accident liability embraces all factors, personal or other, that determine accident incidence.

It is characteristic that accident-prone individuals are, generally, frequent visitors for non-injury conditions. There is suggested in this relationship that poor health might account in part for some people having an undue number of accidents. Since accident-prone people can be partly differentiated on the basis of psychological tests, it is by no means certain that causation is exclusively organic and the poor health previously mentioned may well be psychosomatic. In other words, both illness and injury in these people may be the result of a common underlying cause.

In any event, these accident-prone individuals tend to remain that way. Under present circumstances, individuals who have an undue number of accidents in one period generally continue to have an undue number of accidents in subsequent periods. Whatever the ultimate causation, it appears to be stable.

Evidence exists to show that those who have an undue number of minor accidents also have an undue number of major ones. It follows that efforts made to prevent people specially susceptible to accidents from incurring injury will tend to protect them not only from minor accidents but from major ones as well.

In view of the relationship between illness

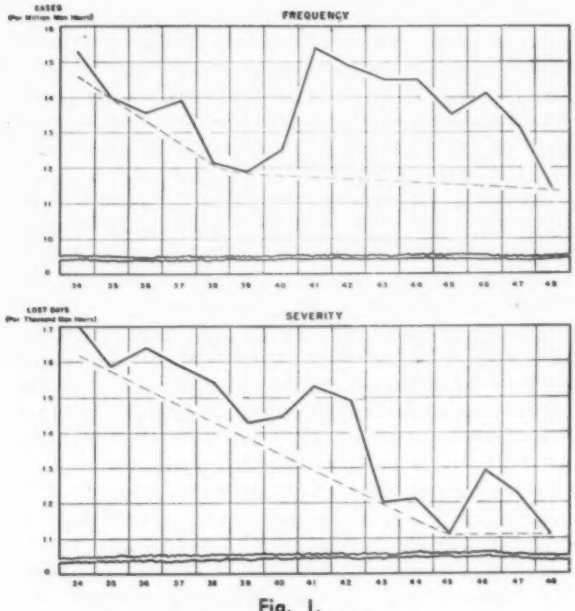

Fig. 1.
Lost time disabilities in all U. S. industries, 1934-1948

and injury in accident-prone people, the frequency with which new conditions are reported —undifferentiated as between injury and illness —provides a relatively quick and accurate means of identifying them. A better method, of course, is one that does not require the risks of experience for identification. Ideally, such a method would utilize pre-placement testing. Tests measuring hand and eye coordination can effectively differentiate accident-prone individuals in the skilled trades, but are of little value among semi-skilled and non-skilled workers where such coordination is a lesser factor in preventing injury.

The necessity for identifying accident-prone employees can better be measured in terms of lost time disabilities than in those of medical department treatments. While less than one-half of 1% of all conditions treated by industrial medicine involve lost time, it is within these cases that the human and economic costs of industrial illness and injury are largely contained.

Fig. 1 shows the frequency and severity of lost-time occupational disabilities for American industry during the 15 years 1934-1948. Frequency is expressed in terms of lost-time cases per million man hours worked, and severity in number of lost days per thousand man hours. It is notable that in the post-war period both frequency and severity have been reduced to a point slightly lower than at any time in the pre-war period. However, the important fact is that the floor lines appear to be leveling off in their downward course.

There are limitations in how far improved methods of treatment can reduce time lost per case, for recovery time will always be required. The great necessity is to prevent such cases from occurring—a flattening frequency curve implies that current accident prevention techniques may have reached their effective limits.

Elimination of environmental or non-personal health hazards has been highly developed in modern industrial safety programs and, in many instances, has come to the point of diminishing returns. Although vitally important, each succeeding dollar or effort expended along conventional lines returns less improvement than the last.

In the final analysis, further investigation of accident proneness and its identification must have top priority on the agenda of industrial medicine. Future success in promoting industrial health lies largely in dealing with the personal factor in accidents.

University of Michigan Junior Medical Students Guests of G.M.'s Pontiac Motor Division

Evening Dinner at the Pontiac Motors Division for Junior Medical Students of the University of Michigan, on tour of the Division, as part of their course in Industrial Health. At the head table, left to right, are Dr. Earl Lutz, Associate Medical Director, General Motors Corporation; Dr. A. L. Brooks, Medical Director, Fisher Body Division, General Motors Corporation; Dr. Clarence D. Selby, University of Michigan; next man not identified; Mr. B. C. Johnson, Night Superintendent, Pontiac Motors Division; Mr. George Watson, Personnel Manager, Pontiac Motors Division; Dr. E. B. Cudney, Medical Director, Pontiac Motors Division; Dr. John M. Lynch; Dr. Max Burnell, Medical Director, General Motors Corporation; and Dr. R. D. Wigent, Assistant Medical Director, Pontiac Motors Division

ASSOCIATION NEWS

THE second planning meeting for the 1951 Industrial Health Conference at Atlantic City, April 21-28, was called by DR. A. G. KAMMER at the Bellevue-Stratford Hotel in Philadelphia, Sunday afternoon, September 17. Representatives of the various participating groups who met in the Green Room included: JOSEPH E. FLANAGAN, JR., of the AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS; CLYDE M. BERRY, ALLEN D. BRANDT, ANNA M. RAETJER, N. V. HENDRICKS, WILLIAM R. BRADLEY and J. B. GISCLARD, of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION; LEONARD S. MORVAY and E. R. ASTON, of the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS; MARY E. DELEHANTY, GLADYS L. DUNDORE, ELIZABETH LAFFERTY and ELIZABETH SENNEWALD, of the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES; and, representing the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS were E. H. CARLETON, A. G. KAMMER, E. A. IRVIN, G. F. WILKINS, A. K. PETERSON, E. C. HOLMBLAD, R. C. PAGE, F. B. LANAHAN, CHARLES-FRANCIS LONG, R. R. BRESLER and C. S. MCKINLEY. There was a morning meeting of the program chairmen of the participating groups to discuss the program features and plan a meeting in which all groups will participate, this to be held probably on Wednesday afternoon of the Conference.

Committees on publicity, scientific exhibits, arrangements, entertainment, and headquarters have been appointed, with representatives from each participating group on all of them. Remarkably satisfactory progress has been made in getting the organization and detail work started. The committees are to be complete prior to December 1. The duties of each are to be outlined, agreed upon and accepted by that date.

The Scientific Exhibits Committee is making plans not only to have available space, but also to make selections and award prizes for the outstanding scientific exhibits. The support of the NEW JERSEY ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, the PHILADELPHIA INTERSTATE ASSOCIATION OF INDUSTRIAL MEDICINE, and the NEW JERSEY ASSOCIATION OF INDUSTRIAL NURSES as host societies will aid greatly in developing a superior Conference.

Report of Final Six Months of Fellowship

SURGERY — COMPENSATION — REHABILITATION: Surgery originally constituted the major part of industrial medicine, for it was through the traumatic surgeon that access was first gained to industrial plants, as injuries sustained on the job were the only responsibility the employer would recognize. When one looks at the vastly different set-up in industry today, it is difficult to realize that the emphasis was on surgery rather than preventive medicine. However, in heavy industries surgery still plays an important role.

The last six months of the Fellowship were devoted to this aspect of industrial medicine, under the excellent supervision of DR. J. HUBER WAGNER, Chief Surgeon of Carnegie-Illinois Steel Corporation. Direct trauma was noted to be relatively unimportant in comparison with the effects of strain on the musculo-skeletal system of the body. By this I mean the muscle lesions, and back, shoulder, and knee lesions. For every fractured femur, a much larger number of back injuries would be encountered. The chronicity of these back lesions is also a greater financial drain than the majority of fractures.

In conjunction with surgery, physical therapy is of immense value after trauma or strain. Normal function of damaged tissue is hastened by this phase of therapy. Alignment of reduced fractures and repair of soft tissue damage may be perfect, but, if articular function is not considered, the end result is poor. Following surgery on the Carnegie-Illinois Service, the after-care included massage, exercise, hydrotherapy, and the use of Faradic stimulation. Further instruction in physical medicine was supplied by DR. MURRAY FERDEBER, who reemphasized the importance of a properly graduated routine in the restoration of function.

In badly maimed workers, a well-integrated routine includes surgery, physical therapy, and rehabilitation. This latter phase is assuming a status in industrial medicine hitherto unknown. Although trauma was stressed in this part of the Fellowship, with treatment continuing until the injured is able to resume a gainful occupation, whether it be his original position or one more suitable, it is not the only means of incapacitation. The cardiacs, arthritics, and hypertensives may also be readjusted to their weakened condition.

As a result of on-the-job injury, the worker receives compensation. The purpose is to tide him over a period of financial loss and to compensate him for disability, partial or permanent. For this reason, if therapy fails to restore complete function or prevent deformity after a severe injury, an intelligent appraisal of the dysfunction must be attempted. Prior to the enactment of compensation laws, a disabled worker was of concern only to himself. Furthermore, it was up to the worker to adjust his impaired function to the best of his ability. Most states now have compensation laws. When an injury occurs, it is reported to the compensation board. The physician attending at the time of accident makes a report of his physical findings and treatment, and estimates the disability. For certain types of injury a schedule of payment is formulated. When dispute arises, the case is referred to the Workman's Compensation Court for hearing, so that impartial and just decisions may be obtained. The court protects the worker, and also the employer, from unscrupulous and unfair demands. The opinion of the industrial physician greatly influences the ruling of the court, so it is essential that the medical facts be presented accurately and completely. I attended many of these sessions, and became familiar with this type of procedure.

The Fellowship in Industrial Medicine that I completed at the University of Pittsburgh was a comprehensive review of industrial medicine and surgery. The courses included Industrial Psychiatry, Industrial Dermatology, Industrial Cardiology, Industrial Toxicology, Industrial Surgery, Silicosis and Tuberculosis, and Radiological Defense and Nuclear Physics, in addition to others. There was much opportunity for practical work at the Pittsburgh hospitals, clinics, laboratories, and industries.

The course was given under the supervision of DR. T. LYLE HAZLETT, Professor and Head of the

Department of Industrial Hygiene at the University of Pittsburgh, and former Medical Director of Westinghouse Electric Corporation. The laboratory facilities at the University of Pittsburgh, under the direction of DR. P. L. BEEBE, afforded an opportunity to study the toxicological problems referred by the many varied industries in the Western Pennsylvania area. It also established a common meeting ground for clinical and industrial medicine.

The Fellowship was necessarily broad in scope, as industrial medicine is a vast field. Industrial diseases are almost as inclusive as general medicine. They involve all systems, and thus an important part of all specialties. Furthermore, other phases of industrial medicine include some knowledge of other professions, engineering, safety, management, etc.

The function of industrial medicine is to promote good health, physically, mentally, and environmentally, and to prevent factors conducive to poor health, whether or not they are of industrial origin. The Fellowship was designed with this aim in view, and has equipped me to carry out that type of industrial program. I am exceedingly grateful to have been granted the opportunity by the AMERICAN FOUNDATION OF OCCUPATIONAL HEALTH to participate in this Fellowship. I am also extremely grateful to DR. T. LYLE HAZLETT for the guidance he has given me, and to the other men in the field of industrial medicine for their interest and help in this endeavor. —JOHN H. JOHNSTON, M.D.

THE Director of the Department of Public Health in Philadelphia has appointed CHARLES-FRANCIS LONG, M.D., Chairman of the Committee on Industrial Health in his division. Members of his committee are DRS. R. RALPH BRESLER, WILLIAM D. FRAZIER, DAN H. PERSING, and HENRY A. SPANGLER. Also, the PHILADELPHIA INTERSTATE ASSOCIATION OF INDUSTRIAL MEDICINE has set up a Committee on Atomic Defense, with CHARLES-FRANCIS LONG, M.D., as Chairman, and DRS. GLENN S. EVERTS, WILLIAM D. FRAZIER, DAN H. PERSING and HENRY A. SPANGLER as members.

Recent Deaths

LOYAL A. SHOUDY, M.D., chief of Medical Service, Bethlehem Steel Company, 1950. (see INDUSTRIAL MEDICINE AND SURGERY, 19:9,6 (September) 1950; and, 19:7, 329 (July) 1950.)

HOMER D. DUDLEY, M.D., F.A.C.S., 1305 Fourth Ave., Seattle, 1, Washington, August 8, 1950. DR. DUDLEY received his M.D. at Northwestern University Medical School in 1902; was a member of the Pacific Coast Surgical Association, North Pacific Surgical Association, American Board of Surgery, American Association for the Surgery of Trauma, A.A.I.P. & S. through the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. He was a member of the staff of Swedish and Kings County Hospitals, and Chief of Hand Service at the latter. For some time, he had been District Surgeon for the Standard Oil Company of California, and Senior Surgeon, Consultant, at the Washington University School of Medicine.

VICTOR J. MEINHARDT, M.D., 312 Lindell Trust Bldg., St. Louis, Missouri. He was born in St. Louis in February, 1894; graduated M.D. at St. Louis University School of Medicine in 1923. He was a Fellow of the American Medical Association, member of the St. Louis Medical Society, and had been a member of the A.A.I.P. & S. through the CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY since December, 1944. He was medical adviser and surgeon to many industrial plants in the area.

BOOKS

Roy Gardner Memorial

PNEUMOCONIOSIS, LEROY U. GARDNER MEMORIAL VOLUME, edited by ARTHUR J. VORWALD, M.D. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1950, pp. 659, $7.50.

ROY GARDNER would have been pleased with the Sixth Saranac Symposium in the fall of 1947. Too he would have been pleased with the published record of the symposium devoted chiefly to beryllium poisoning, and dedicated to him. The format of this memorial volume wholly departs from its predecessors but the flavor of those other constructive symposia remains intact. Through seven lengthy sections the known and the unknowns of beryllium poisoning along with Shaver's disease are faced in forthright fashion by the 200 participants.

All the Saranac symposia have been characterized by a happy fervor, a spiritual zeal—the earnest business of adding to the sum total of medical understanding. This spirit appears on the first textual page when DR. SHIPMAN begins his history of beryllium poisoning. He states:

"Every physician can understand the excitement of the medical man who encounters what appears to be a new disease entity. Perhaps we have that here, perhaps not. Our story begins in the fall of 1941, when two women came under observation at the Essex Sanatorium in Middleton, Massachusetts. Both were complaining of severe and disabling dyspnea, and, as their symptoms were primarily pulmonary, it is perfectly understandable that they should have arrived at the local tuberculosis sanatorium. Both had been ill for two or three months, and were obviously extremely ill. Except for the severe shortness of breath, physical signs were almost completely absent and the laboratory findings were largely negative. The chest roentgenogram, however, in both cases showed a fine miliary mottling evenly distributed throughout both lungs.

"The first diagnostic guess was miliary tuberculosis, but this did not quite fit, and the occupational history would not, it seemed, sustain a diagnosis of pneumoconiosis. Boston consultants, who saw one of the patients in December, 1941, made a diagnosis of pulmonary sarcoidosis. There the matter rested for a time. The two women quite obviously had the same condition, but no unusual significance was attached to the fact that they had both worked in the same building of a plant manufacturing, among other things, the then quite new fluorescent lamp. Nevertheless, no one was entirely satisfied with any of the diagnoses so far offered."

Because no one was quite satisfied, ultimately came the Sixth Symposium and this volume. Stemming from this Symposium has come the newer knowledge of beryllium poisoning, over and above that of the initial foregathering.

While the publication of this memorial and memorable volume has been understandably delayed, its editor has made this book timely by inclusion in the extensive bibliography references to all known publications up to 1950.

JOHN F. McMAHON
(1903—1950)

JOHN F. McMAHON, Managing Director at the Industrial Hygiene Foundation, died suddenly in his office at Mellon Institute, Pittsburgh, Pennsylvania, on September 15, 1950. He had been an administrative Fellow of the Institute for 14 years, and directed the Foundation since 1942.

John, as he was known to a host of friends, was born in South Waverly, Pennsylvania, and received his early education at Sayre, Pennsylvania. He was graduated from Notre Dame University with a Bachelor of Arts Degree in 1928. From 1929 to 1936 he served in various capacities in newspaper and public relations work.

At the beginning of his career he served as a reporter on the *New York Sun*. Later he spent two years in public relations work for Columbia University, the American Chemical Society, and other technical organizations. He then was night editor for the Associated Press in Pittsburgh, and after four years became associated with Mellon Institute. His early work at the Institute was concerned with public relations.

When he became interested in industrial hygiene, the profession had not received universal recognition, as industry was not fully convinced of its importance. His work toward the advancement of industrial hygiene has in no small part contributed to the high regard the profession now enjoys. His aptitude for writing about technical subjects in a non-technical manner, forcefully brought the subject of industrial health before plant executives, professional groups and the public.

In his eight years as Managing Director, the Industrial Hygiene Foundation grew steadily until now it has more than 200 member companies; it has commanded the respect of industry, labor and scientists; and its members continually depend on its services, advice and guidance in industrial health problems.

John had a great capacity for developing interesting and different programs for the Foundation's Annual Meetings, which were valuable contributions to both the scientific and administrative phases of industrial health. He had a faculty for apt epigrams, which added zest to the meetings. His dynamic personality and his warm friendship for those with whom he associated were among the many traits that drew people to him.

His was the ability to attract a technical staff of high caliber, and this contributed generously to the scientific literature during his years as Foundation Director.

His passing will be keenly felt. The Institute, the Foundation's staff and all who knew him will miss his friendly smile, his sound counsel, and his leadership. Above all, industrial hygiene will miss a true friend.

—HERBERT T. WALWORTH

Industrial Hygiene Foundation Annual Meeting

JOHN McMAHON'S direction and guidance of the Annual Meetings of the Industrial Hygiene Foundation brought him a national reputation as a "health planner" and made the Foundation Meeting one of the big events of the year in industrial medicine. The Fifteenth Annual Meeting is scheduled for November 15 and 16 at Mellon Institute in Pittsburgh. The Medical Conference, the Medico-Legal Conference, the Chemistry and Toxicology Conference, and the Engineering Conference will be held November 15, with the Management Conference on the 16th. Keynote speaker at the Management Conference will be DONALD K. DAVID, Dean of the Graduate School of Business Administration at Harvard University.

PRODUCT RESEARCH AND DEVELOPMENT

The Effects of a New Adhesive Tape Remover on Guinea Pig Wounds

E. S. OLSON, M.D.,
Racine, Wisconsin

THE purpose of this paper is to appraise the effect of a new adhesive tape remover on wounds artificially inflicted on guinea pigs. This tape remover contains ethylene glycol monoethyl ether ($C_2H_5OCH_2OH$) and ethylene glycol monobutyl ether ($C_4H_9OCH_2OH$), with an aqueous sodium sulfate of heptadecanol as a penetrant. This product is dispensed in a convenient container to permit easy application of the chemical to the adhesive tape. It is marketed as TAPEAWAY*. The adhesive tape is sprayed with the tape remover. The tape is then gently lifted off. The surface is wiped off. If more tape is to be applied, the skin is wiped with cotton moistened in water. On waterproofed tape, it is necessary to lift up the edge of the tape and spray beneath it.

The approach to this problem was carried out on three different groups of guinea pigs. Each group consisted of 12 animals. Each animal in the three groups was anesthetized, and a 2.0 cm. incision was made through the skin just lateral to the spine. The wounds were managed differently in each group.

GROUP I: The purpose of this was to determine the effects of the tape remover on the open wound. The tape remover was sprayed upon the wound when the wound was inflicted. Thereafter the wound was sprayed twice daily with the tape remover for nine days, and was observed for evidence of infection and healing. To determine the degree of infection, bacterial cultures were taken 18 hours, and four days and six days after the incisions were made. The cultures were taken with a sterile applicator from the wound. The applicator was placed in thioglycollate medium. After a two-hour incubation period, 1 cc. of the broth culture was used to make a blood agar pour plate from each sample. Chloral hydrate was added to the agar to inhibit the growth of proteus. At the end of 24 hours a colony count was made from these pour plates. Smears were made from the broth cultures to determine the type of organisms present. The smears showed gram positive cocci, diplococci, gram positive rods and gram negative bacilli.

Cultures taken the first day after the initial incision gave the following results: In three instances, the colony count was 15 to 100. In five instances, the colony count varied between one and five. The four remaining pour plates showed no growth.

Cultures taken on the fourth day showed one pour plate that had 92 colonies. Nine had up to six colonies; the remaining two showed no growth.

Cultures taken on the sixth day showed three pour plates with counts that varied from five to 29. The remaining nine cultures contained fewer than five colonies. In five of these cultures, there was no growth.

*TAPEAWAY is the trade name for a combination of the chemicals noted above. The proportions of the chemicals are not given. It is marketed by the Carand Corporation, Racine, Wisconsin. TAPEAWAY has been accepted for advertising in the *Journal of the American Medical Association*.

GROUP II: THE animals in this group were used as a control of Group I.

The 12 pigs in this group received the same 2.0 cm. incision. The wounds were not treated in any way. The same observations were recorded as noted for Group I. Cultures taken the first day after the incisions were made gave the following results: Three plates had a colony count that ranged from 70 to 352. Three other plates showed a colony count of 5 to 12. Five plates had a colony count up to five. One plate showed no growth.

Cultures taken on the fourth day showed a colony count that varied from 80 to 130 in three instances. Five were below five. Four cultures showed no growth.

The colony count on the sixth day was 25 in one instance. In six instances, it varied from one to two. In the remaining five, there was no growth.

GROUP III: IN THIS group of 12 pigs, an incision was made 2.0 cm. lateral to the spine, similar to those inflicted in the above groups. Adhesive tape was applied about the body of the animal so as to cover the wound. The adhesive tape was saturated with the tape remover daily. The tape was removed and clean adhesive tape was applied each day. These wounds were studied similarly to the two previous groups. Cultures taken on the first day showed one plate with a colony count of 42. In seven instances, the count varied from one to four. In four instances, there was no growth. Cultures taken on the fourth day revealed six plates with colony counts between 100 and innumerable. Four plates showed colony counts between one and 38. Two of the plates showed no growth. Cultures taken on the sixth day showed four plates that had a colony count that varied from 100 to innumerable. The other eight plates showed a colony count that was below two.

THE bacteriological studies on the three groups showed interesting results. The open wounds treated with the tape remover twice daily for 11 days showed a lower bacterial count than a similar group that had open wounds not treated with the tape remover. The group that had adhesive tape applied to the wound showed bacterial counts that were lower in general at first. The bacterial count on subsequent cultures for this group was higher than the other two groups, which is as might be expected. The adhesive tape could not be kept in place on the animals; it became detached from the skin and contaminated the wounds. The irritation of the detached tape was another factor that prevented healing and also irritated the skin immediately about the wound. A comparison of the degree of contamination can be seen in Fig. 1.

The reduced bacterial count indicated that the tape remover was bacteriocidal.

Staphylococcus albus was used to study this property. A dilution of the adhesive tape remover was

prepared in agar and a loopful of a 24-hour culture of staphylococcus albus was added. It was found that a 1-20 solution of tape remover inhibited the growth of staphylococcus albus, while in the higher dilutions there were innumerable colonies.

The next problem was to determine the effects of the adhesive tape remover on the healing mechanism. It was found that the first group healed the best. This was the group in which the tape remover was applied twice daily. This is what might be expected if the tape remover were not irritating, as the bacterial count was reduced in this group, as noted previously.

The group that had adhesive tape applied did not do well because of the irritation of the detached adhesive tape, as noted. To estimate the speed of the healing process in the three groups, the length and breadth of the wounds were measured and these two figures were multiplied. This was done on the 13th and 17th day. The results are plotted in Fig. 2.

The wounds of Groups I and II were photographed on the 1st, 4th and 16th days.

The wounds of Group III were photographed on the 1st and 4th days.

The adhesive tape was discontinued in the Group III animals on the 13th day. In most instances, the surface of the wounds was the largest at that time owing to the irritation and contamination of the detached adhesive tape. Greater absorption could be expected from such wounds. These wounds were then sprayed with the tape remover three times daily for three days. There was rapid epithelialization after the adhesive tape was removed and the tape remover was applied. The animals were then sacrificed and the livers and kidneys of all of them were examined grossly and miscroscopically for toxic changes.

These examinations failed to show any evidence of toxic changes.

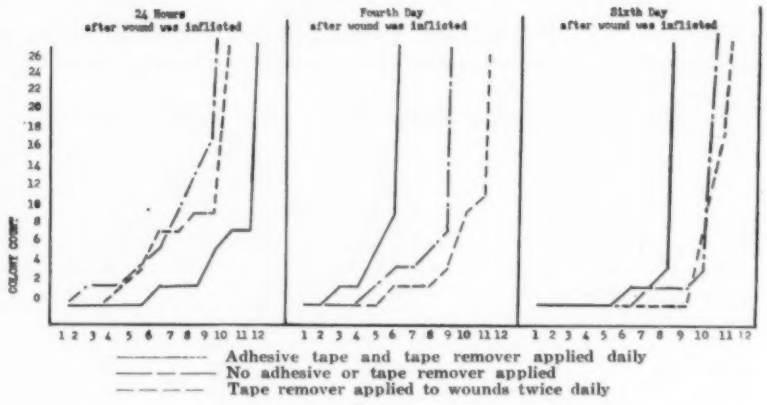
24 Hours after wound was inflicted
Fourth Day after wound was inflicted
Sixth Day after wound was inflicted
COLONY COUNT
Adhesive tape and tape remover applied daily
No adhesive or tape remover applied
Tape remover applied to wounds twice daily

Fig. 1.

Comparison of the Colony Counts. The plotted curves show how the colony count was the lowest in 24 hours with the adhesive tape and the adhesive tape remover. The colony count taken on the fourth and sixth days showed the colony counts to be greater in this group due to irritation of the detached adhesive tape and contamination of the wounds from this source. The colony counts were best when the adhesive tape remover was applied to the open wounds. This demonstrated the bacteriocidal action of the adhesive tape remover

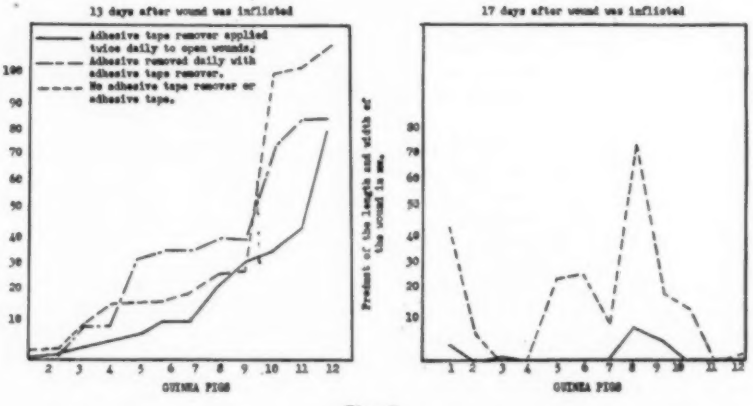
13 days after wound was inflicted
Adhesive tape remover applied twice daily to open wounds.
Adhesive removed daily with adhesive tape remover.
No adhesive tape remover or adhesive tape.
17 days after wound was inflicted
GUINEA PIGS

Fig. 2.

Comparison of the area of the wound as estimated by multiplying the length and the width of the wound. The plotted curves compare the open wounds on the 13th and 17th days. The wounds treated with the tape remover healed faster than those that were not treated. The group with adhesive applied was not followed beyond the 13th day as the wounds would not heal due to the irritation and contamination from the detached adhesive tape

SUMMARY: Three groups of guinea pigs were inflicted with a wound 2 cm. long. Each group consisted of 12 animals. In one group, the adhesive tape remover was sprayed on the open wounds twice daily; the wounds of the second group remained untreated. The third group had adhesive tape applied to the wounds daily. The adhesive tape was sprayed each day with the tape remover before it was removed. The adhesive tape became detached from the skin and contaminated the wounds and irritated them by friction. The wounds became larger because of this. These wounds improved rapidly after the adhesive tape was discontinued and after they were sprayed with the adhesive tape remover three times a day for three days.

All of the experimental animals were sacrificed after the three-day period and the liver and kidneys of each one were examined grossly and microscopically.

There was no evidence of toxic changes with this excessive application of the tape remover.

The wounds that were not covered, but sprayed twice daily with the tape remover showed a lower bacterial count and the wounds healed faster. The rapid healing indicated that the tape remover did not irritate the open wounds.

It was found that a 1-20 dilution of the tape remover in agar prevented the growth of staphylococcus albus.

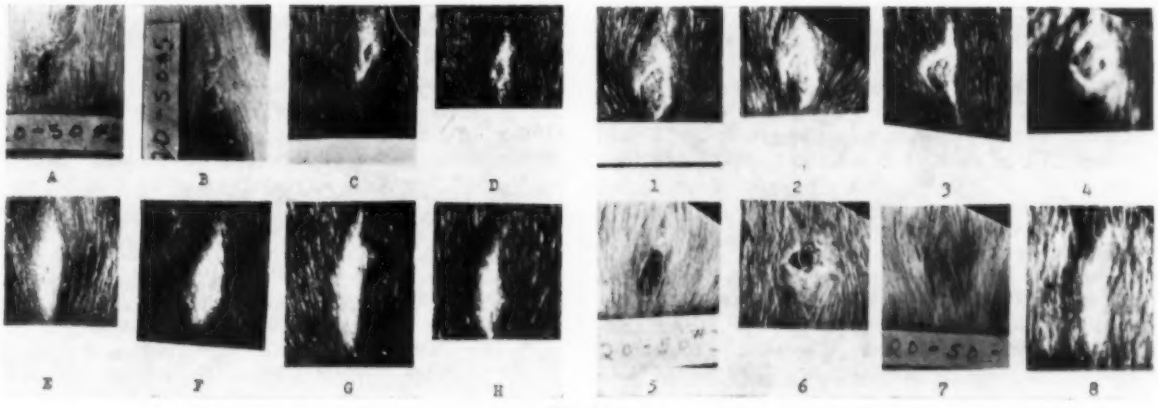

Fig. 3.

Comparative photographs on the 16th day. Photographs Nos. 1-8 were taken 16 days after the wounds were inflicted. They are the control group. Note the size of the wounds and the indurated edges as compared with the lower series. Photographs taken of the remainder of the animals showed wounds healed and are not included. Photographs Nos. A-H were also taken 16 days after the wounds were inflicted. The wounds were sprayed with the adhesive tape remover twice daily for nine days. These wounds are smaller in size and there is less induration as compared with the control group pictured above. The wounds in this group progressed more satisfactorily because the adhesive tape remover reduced the bacterial flora and was not irritating to the wounds

CONCLUSIONS: (1) The tape remover described is bacteriocidal and non-irritating to open wounds.

2. Wounds sprayed with the tape remover heal faster than a similar control group.

3. The tape remover is non-toxic to guinea pigs when sprayed on wounds.

4. The tape remover is safe to apply to open wounds.

[NOTE: Grateful acknowledgment is given to MR. KARL YORK for the photography that was done; also to MRS. FRANCES BEAUGRAND, MRS. BETTY NELSON and MR. DICK URBUSH for their technical assistance.]

LETTERS

Appreciation

TO THE EDITORS: Ever since the dawn of industrial medicine and surgery there has existed an earnest desire on the part of those engaged in its practice to win a word or two of approbation as evidence that their efforts were really appreciated. Never have they flagged in their determination to do their best to sell themselves and establish their indispensability, whereas at their beginning they were decidedly "personae non gratae," and well aware of the fact.

Unfortunately, during the last 30 years of growth and development of industrial medicine and the establishment of modern, well-equipped medical departments, appreciation on the part of the employee personnel of any such service has lagged far behind. But, nothing daunted, the medical personnel has tried harder than ever to win some degree of commendation, not from management, but from the "privates" in industry. Doctors and nurses are laboring on from sheer sense of duty, paying little or no heed to what may be said of them, content now and then with a more or less perfunctory pat on the back from various representatives of management and a knowledge that they are doing their best.

The writer has spent 26 years in industrial medicine and many times has been discouraged no end, feeling that hard work and honest effort were entirely unavailing. Then just about the time when utter frustration was imminent and things looked blackest, along would come a word of appreciation, entirely unsolicited, from someone in the ranks who had not merely taken for granted a good service, but also wanted to go out of the way to write about it. To illustrate, here are portions of two such letters, one from a lady clerk and one from a telephone repairman:

"Perhaps a note of thanks is not quite customary from an employee, but surely a kindly thought is not amiss, especially at this season of the year! So, to the doctors, nurses and staff, I wish to express my sincere appreciation for their services during my illness and convalescence. I never fully knew the great scope of my medical department or the services it is prepared to render so efficiently. Indeed, I am proud to belong to a company that takes such an interest in its employees' welfare."

"I wish to take this opportunity to thank you for your letter regarding my physical condition and the suggested correction. In a company of the size to which ours has grown so rapidly it makes one more appreciative of the amount of work that you in the medical department do to keep up on us individually. Thanks."

Mr. Edgar Dale, Editor of *Newsletter*, in a recent article cites the case of a note Dr. William L. Stidger, a prominent clergyman, wrote to a former schoolteacher. In the note he thanked her for her contribution to his success in life, and her answer contained these words, "You will be interested to know that I taught school for 50 years and yours is the first note of appreciation I ever received."

In another instance, a man who had had a watch repaired was pleased enough to walk into the jeweler's and tell him what a fine job he had done. The reply of the smiling watchmaker was, "You know, you are the first person in my whole life who ever

came in and told me that his watch was running fine.... I get all the bad news about watches, but none of the good."

When taking a long train ride, especially an overnight one, it is the writer's custom to drop by the engine cab and thank the weary engineer for a safe journey. To be sure, it is his job to bring the long train in safely, but he certainly feels better if one lone passenger out of several thousand will thank him for it. And so, the industrial physician—working day after day to raise the standard of his work, minimize the accidents, cut short or even prevent the illnesses, and lend advice and counsel to those emotionally upset—is happy with a word of appreciation. Rare though it may be, it spurs him to greater endeavor. —HENRY S. BROWN, M.D.

Some Thoughts Wrought from Beryl

TO THE EDITORS: I propped myself against a pillow to ponder the problem. My unrest stemmed from disappointment over the reception accorded that same afternoon to one of the features of our Section on Industrial Health (A.M.A. Convention, June 26-30, 1950). The Symposium presented was on the "Dynamics of Industrial Hygiene."

I shall not labor you with the details except to state that the Symposium dealt with an unidentified occupational case history. Utilizing a plant physician, a hygienist, a chemist, and an engineer, the audience participated in the proper procedure to identify and control a noxious industrial agent, which, in this instance, was beryllium. At the beginning of the meeting a goodly crowd was there (the Section meetings this year had much better attendance than ever before), but gradually the crowd diminished until only a handful remained—a small group of men who already knew all that is known about this bizarre and beguiling metal.

Why had the others departed? Wherein did this Symposium lack interest? Why had it attracted no larger initial audience than it did? Staring out of the darkness of my room and across the Plaza into the lights of San Francisco, I reflected upon the nature of this convention and other medical conventions. Before falling asleep I believed I knew, in part, the answer.

Several days previously I had stood at Van Ness and Fell streets watching an ant-like stream of physicians entering the High School of Commerce Auditorium. Almost child-like, they were playing "follow the leader." "Is Sir William Osler speaking here this afternoon?" The young physician to whom I directed my question looked blank. "No," he replied, "I do not think so." He started on, and then turned to add, "I am sure he isn't. This, you know, is the meeting about ACTH." As he hurried on, I hoped he might, at some time, wonder why I had asked the question. I did not follow the mob.

Other days and other scientific meetings were similar. ACTH, cortisone, a new drug for this or how to treat that, drew the crowd. This was further evidence that we were living in the therapeutic age of medicine. This was again shown by my interrogation of individuals. At the end of each day while having a lemonade at the Palace or St. Francis bar I would converse with the man on the next stool whose lapel insignia revealed him to be a member of the American Medical Association. When asked what he had listened to that day, he waxed enthusiastic over some paper on therapeutics.

We are a profession of symptomatic practitioners, I concluded. This indictment does not exclude the specialists. The art of taking an accurate history or of inspection, palpation, percussion and auscultation is adhered to by a few of the old school and is ignored except for a few of the newer generation of physicians. Diagnosis today is engulfed within a concept of symptomatic treatment. In the routine of handling a reception room full of patients, apparently time allows for only a sketchy history and a cursory examination. But, alas, the patient *must* have a prescription in hand as she or he leaves the office. Prescription for what? A prescription, of course, for the symptoms. It calls for a new drug, untried, but widely heralded.

To the observing or thinking individual the point needs no further development. Perusal of the programs presented by the various medical groups reveals the predominance allotted to the subjects of therapeutics. We have an association known as the American Therapeutic Society (of which I am a member), but to my knowledge no national Diagnostic Society. Probably "the best seller" of all medical textbooks is the one entitled, "Treatment in General Practice." A textbook on diagnosis is purchased primarily by third-year medical students and sold upon the completion of the senior year to enable the acquisition of a book on treatment.

Occupational medicine can hold no great attraction for the therapeutic fanatic or mercenary prescriber. There simply is no opportunity for such, since treatment by drugs is not of paramount importance in this phase of practice. No doctor can hope to gain community-wide recognition for being a genius if his treatment of an occupationally-ill patient is merely *withdrawal from exposure*. There is nothing mysterious about that; nothing in such a simple procedure that will add to a physician's community prestige.

To offer further evidence of our drug addiction, even preventive medicine is practiced largely by administering drugs—"anti" drugs. Admittedly the profession has done an excellent job of preventive care by immunization. But any preventive health measures which cannot be carried out in the office utilizing vaccines or serums is left to the Public Health Service and, I might proudly add, to industrial health programs. The reason is self-evident. In the symptomatic method of practice, early, minor defects will not be detected, and as long as this system persists we cannot expect optimum preventive medicine in general practice.

Such were my nocturnal musings wrought from beryl. This midnight session with my thoughts convinced me that occupational medicine attracts to its practice only those whose vision appreciates that mankind's needs cannot be satisfied by drugs. As sleep encompassed me I found myself wishing I had done more than jest with the young doctor at the corner of Van Ness and Fell. I wish I had asked him to read "Aequanimitas," wherein Osler writes:

"In the fight which we have to wage incessantly against ignorance and quackery among the masses and follies of all sorts among the classes, diagnosis, not drugging, is our chief weapon of offense. Lack of systematic personal training in the methods of the recognition of disease leads to the misapplication of remedies, to long courses of treatment when treatment is useless, and so directly to the lack of confidence in our methods which is apt to place us in the eyes of the public on a level with empirics and quacks." —RUTHERFORD T. JOHNSTONE, M.D.

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Foreign Correspondents

IN THE interests of its readers and the medical organizations that it serves as their official organ, this Journal is well and happily committed to a policy of coverage for the entire world of occupational health. This aspect of expansion is factually reflected in the August issue—almost entirely devoted to plantation medicine and centering about the Hawaiian Islands. While the Hawaiian Islands by no means constitute a foreign country, having almost attained to statehood in the United States, geographic remoteness lends newness and freshness to their scientific compilations.

To this objective of world coverage, arrangements have been consummated whereby the foreign countries soon to be identified will have as their spokesmen, these physicians now for the first time presented:

PROFESSOR DR. JOSE PEDRO REGGI, Director General de la Union Americana de Medicina del Trabajo, Buenos Aires, *Argentina.*

DR. DOUGLAS GORDON, Medical Officer in Industrial Health, Department of Public Health, Queensland, Brisbane, *Australia.*

DR. A. UYTDENHOEF, L'Inspecteur General, Chef de l'Inspection Medicale, 79 rue Joseph II, Brussels, *Belgium.*

DR. A. R. THOMPSON, D.P.H., Medical Officer, Vauxhall Motors Ltd., Luton, Bedfordshire, *England.*

DR. PERTII SUMARI, Director, Medical Department, Institute for Occupational Health, Helsinki, *Finland.*

DR. A. SALMONT, 30 Bd. de la Saussaye, Neuilly S/Seine, *France.*

PROF. DR. MED., DR. MED. H. C., E. W. BAADER, Direktor des Knappfchaftskrankenhaufes Hamm (Westf.) vorm. des Univ.-Institutes für Berufskrankheiten Berlin, Bad Hamm, *Germany.*

DR. P. A. VAN LUIJT, Medical Adviser, Centrale Dienst der Arbeidsinspectie, Nieuwe Uitleg No. 12, 'S-Gravenhage, *The Netherlands.*

DR. AXEL AHLMARK, Chief, Clinic for Occupational Diseases, University Hospital, Stockholm, *Sweden.*

DR. G. W. H. SCHEPERS, D.Sc., Silicosis Medical Bureau, Johannesburg, *Union of South Africa.*

Arrangements are in progress for representation also in the following countries: Brazil, Cuba, Italy, Israel, Mexico and Peru. As these plans are perfected, additional names will be presented on the masthead.

Always it shall be our purpose to conduct all items of editorial import to these several countries only through these foreign associates. These are urged to furnish meritorious scientific manuscripts, news letters and commentary at every opportunity to the end that such rapport will be established that, at least in occupational medicine, never will there be any need for thinking, writing or publishing the word "foreign."

"Trauma 2 to 1"

HARRY B. BURR'S excellent study "Quantitative Patterns in Industrial Medicine" (page 489) discloses that, in terms of total medical department treatments in the situation he writes about, "it's trauma 2 to 1." The ratio is a forceful reminder that surgery hasn't lost its importance in industrial medicine. MR. BURR also shows that 80% of the trauma is to hand or eye—with 65% hand injuries, 15% eye injuries. By way of explanation he points out, "In an indus-

trial environment involving a multitude of hand-tended machine operations, the hand and, to a lesser extent, the forearm are the sole members coming in direct contact with the materials being processed and/or employed in processing. In most instances they are those anatomical parts most proximate to the working tool. Under such circumstances, it is obvious that; groupwise, the hand and lower forearm are considerably more exposed to injury than the remainder of the body and, for this reason alone, most frequently injured." With more than 50% of the traumatic aggregate thus consisting of hand injuries, it is timely that in this issue we feature hand surgery. The five articles on the subject (pages 453-470) were the highlights of the meeting of the Section on Hand and Restorative Surgery, of which DR. WILLIAM F. LAUTEN was protagonist and over which he presided, at the 35th Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. Those who attended this Section meeting were doubly impressed, first with the tremendous interest displayed in the subject, as evidenced by the fact that not even standing room was left in the meeting quarters, and second, by the presentations themselves. With numerous illustrative slides and interesting discussions, these presentations were so gripping in their attention-commanding qualities, that the printed pages here—especially as to the necessarily limited number of pictures—are almost by way of an echo. But although they must be no more than that—as all such things emerge when shorn of the personal warmth of the occasion—they are a *good* echo. They are followed by several more articles on surgical subjects, and by DR. MACKAY'S interesting study on the "Re-Employability of Persons Released from Mental Institutions," which in itself would be a feature in any journal.

Who Knows—And What

STRANGELY enough, there is encountered among physicians — industrial and otherwise — a reticence to appear in informative biographic and professional listings other than the admirable A.M.A. Directory and comparable specialty board directories. When this reticence is explored it sometimes develops that, over and above the lazy man's aversion to filling out any more blanks, there exists a modest resistance to support what in error is adjudged to be but personal "puffery" akin to the smug social "White Books" and "Blue Books." An about-face is in order. Truly on a low level there may be ill-conceived biographic compilations designed for the purposes of adulation, serving few ends beyond the larding of the pockets of promoters and expanding the egos of those favored, and usually saddled with obligations. For those evil ones our scorn equals that of any other person. But there are others, as best exemplified by "Who's Who In America" and "Who Knows—And What," both published by The A. N. Marquis Company.

At its best no admirable register is devised for the aggrandizement of any individual and not necessarily calculated for his benefit. Rather, such records are for the benefit of the public or special segments of the public. In "Who Knows—And What," a relatively new publication, the stress is not directed to conventional biographic items but to special skills, special knowledge, and who possesses such, and where the possessor may be found. Day by day some tens of thousands of well-intentioned persons harriedly are in immediate need of peculiar information located in the minds or archives of only a few score persons the country over. Some engineer in Macon, Georgia, might know, more than any other person, the dimensions of railroad tunnels in Mexico; one man only, possibly in Midland, Michigan, may have been the sole investigator of the toxic properties of a new insecticide; no more than a score of scientists might fully know just what disease may be transmitted to man by pigeons, and on and on.

Serving the hectored needy ones becomes the function of "Who Knows—And What." This publication itself may never know all, or know all who have particular gifts, or gleanings, or findings; but accessible reference to its endless carefully produced indices and categories will happily lift many a heavy millstone off the sweating shoulders of those shouting for precise guidance.

This Journal already has published the formal statements of the publisher of "Who Knows—And What" as to its purposes, objectives and procedures. Without prospect of material gain, and purely on the basis of furthering, at all times, constructive contributions to the country's betterment, this Journal further records its support for this fetching enterprise.

Should you, as one of few having in hand special segments of information, be tapped on the shoulder by a "Who Knows—And What" blank, let it be agreed that you have no need for aggrandizement, perhaps no need for any more clients—but that *you* have built that better mousetrap, and the needy world has made that path to *your* doorstep.

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Breakfast

A SERIES of reports have been published on the measurement of maximum work output, choice reaction time, and neuromuscular tremor of men and women following the omission of breakfast and the consumption of various types of breakfasts. Young women between the ages of 22 and 27 showed considerable individual differences in response to the alteration of the breakfast pattern. When breakfast was omitted or only coffee was consumed, there was a decrease in maximum work output and an increase in choice reaction time and neuromuscular tremor during the pre-noon period as compared with the response to a 400-calorie meal of fruit, toast, butter, milk, and coffee and an 800-calorie meal of fruit, cereal, cream, egg, bacon, toast, jam, milk, and coffee. A group of 10 men served as subjects for an extension of this study. The same physiological measurements were made when no breakfast was served and was compared with the morning responses following consumption of a basic breakfast of 750 calories consisting of fruit, cereal, milk, sugar, toast, butter, and jelly. The unfavorable reactions of the men to omission of breakfast were more pronounced than were those of women subjects. Hunger, dizziness, nausea, and vomiting were reported irregularly by some and consistently by others. Omitting breakfast reduced the maximum work output, caused a slower reaction time, and increased neuromuscular tremor during the morning hours for most of the men studied. A number of cross comparisons were made on the reactions of women subjects to different types of breakfasts. No specific differences were reported for the response of these subjects to breakfasts of 300, 600, and 1,000 calories (containing ½ pint of fluid skim milk, ¾ pint of whole fluid milk, and ½ pint of whole fluid milk respectively). As all subjects were allowed free choice of any food they wanted for the other two meals of the day, no consistent change in the body weights of the women subjects was observed whether breakfast was omitted or it consisted of black coffee alone, or of 300, 600, or 1,000 calories.

—*Dairy Council Digest*, 111 North Canal Street, Chicago 6, Illinois.

Training for Retirement

TRAINING for retirement is no longer a personnel department joke. Companies are discovering that there is some merit in fitting and preparing older workers to taper off instead of pushing them off the payroll. Many older workers go through a severe stage of mental and physical shock on finding themselves no longer at their bench

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or desk. Even some executives who have been retired on handsome incomes still find that they are not prepared to take the jolt. Some firms are now realizing that there is a duty to instruct, counsel and advise their retirees. The program may cover several years and consist of group lectures, round-tables on company time, company-sponsored luncheons each month during the last year of service, film showings of other men's retirement experiences, small business ventures, hobbies, how Bill Jones retired on five acres, etc. Among the companies that give informal and intermittent attention to retirement counseling are Eastman Kodak, American Rolling Mills, U. S. Rubber, Shell Oil, Standard Oil, Western Electric, Bell System, Socony-Vacuum. Several small and independent oil firms in the middle-west have successful plans.

—Personnel News Bulletin, California Personnel Management Association, September 12, 1950.

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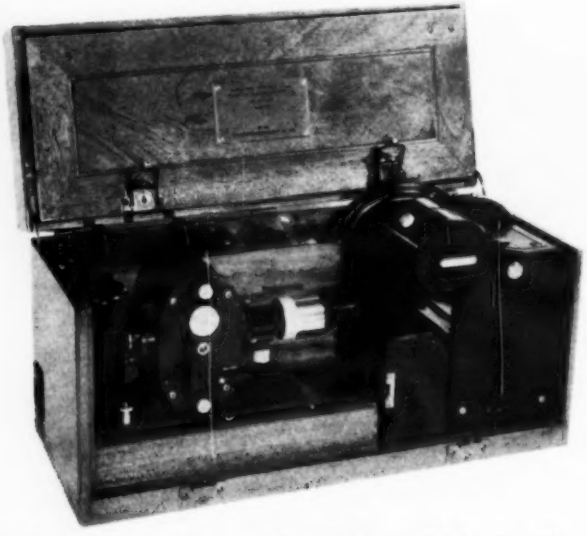

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Sugarless Sweet

BRIGHTER meals are in store for diabetics. The new non-caloric sweetening agent called Cyclamate Sodium has just been introduced on the market by Abbott Laboratories. The product, whose active ingredient is sodium cyclohexylsulfamate, doesn't lose its sweetness in cooking, baking or canning, and it has no bitter after-taste. Food and Drug Administration has approved it for sale without prescription. The sweetener is being put up in tablets containing ⅛ gram of active ingredient plus sodium bicarbonate and tartaric acid for effervescence and rapid dissolving. Each tablet is rated the equivalent of one teaspoonful of sugar. Price: 59 cents per 100-tablet bottle, with 1,000-tablet bottles at a lower unit price.

—*Chemical and Engineering News*, 28:23, June 5, 1950.

Largest Research Lab

THE world's largest research laboratory devoted to the development of safety equipment for all industries was dedicated in Pittsburgh, June 14, by the Mine Safety Appliances Company. About 400 leaders in safety and industrial hygiene and health, as well as top industrial executives, attended the dedication exercises. Director of Mine Safety Appliances Company's Research and Development is DR. WILLIAM P. YANT. A member of many technical societies and associations, he was the first president of the American Industrial Hygiene

Foundation. In 1946 he received the Pittsburgh Award of the American Chemical Society for distinguished service to chemistry. Recently, he was appointed chairman of the steering committee of the U.S. Technical Conference on Air Pollution.

Oysters in the "R" Months

MARK D. HOLLIS, Assistant Surgeon General, Public Health Service, says the tradition that oysters must be eaten only in the "R" months may have originated somewhat as follows: (1) In that species of oyster eaten in the Old World for centuries, fertilization of the seed from which the baby oysters grow takes place within the shell of the parent oyster. Shortly before the baby oysters are ejected by the parent to fend for themselves, they begin to develop a shell. If the Old World oyster is eaten at this stage of incubation, the large numbers of almost microscopic baby oysters, each developing a shell, impart a gritty quality to the meat. Because the reproductive period of all oysters is in the summer, early settlers of this country, cognizant of this but mindful of their Old World variety, avoided placing New World oysters on the menu until later in the year. It is only coincidental that those months in which the oyster is most palatable happen to be the "R" months. (2) Even after our forefathers discovered that the North American East Coast oyster fertilizes its eggs in the sea water outside the parent shell, oyster consumption in this country continued, for the most part, to be a winter activity. Partly responsible for this was the fact that only in recent years have refrigeration facilities been developed whereby oysters can be preserved in warm weather while being transported from the costal growing areas. (3) Today, when many perishable food products are transported thousands of miles by railroad and airplane, preserved by refrigeration, and eaten without a qualm by the general public, still most of the country's shellfish consumers cling to the old tradition.

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Mixed with Water For Injection, U.S.P., or Isotonic Sodium Chloride Solution, U.S.P., Com-Pen quickly forms a homogeneous suspension. Its particles of procaine penicillin G are uniformly dispersed due to the presence of small amounts of harmless dispersing agents. A minimum of agitation is required prior to aspiration.

Because of the high degree of subdivision of its procaine penicillin particles, Com-Pen is easily aspirated through a 20-gauge needle prior to injection. Prepared suspensions of Com-Pen may be kept at room temperature for one week, or at refrigerator temperature for three weeks, without significant loss of potency.

Com-Pen is readily injected through a 20-gauge needle. Small particle size and a homogeneous suspension make this preparation unusually trouble free. This outstanding feature is especially important in both hospital and office practice. Com-Pen is indicated whenever a repository type of penicillin is called for.

Package Information—Mixed according to directions, Com-Pen produces a uniform suspension, each cc. containing 300,000 units of crystalline procaine penicillin G. Com-Pen is supplied in: (1) five dose vials containing 1,500,000 units, (2) single dose vials (300,000 units) in individual boxes, and (3) single dose vials in boxes of 50.

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Depends on How They're Used

THE Food and Drug Administration has decided that some antibiotics are good and not drugs, when they're used in mixed feeds as growth stimulators for livestock and poultry. Result: Aureomycin and APF—animal protein factor—must comply only with the general provisions of the food laws. Criterion is whether the substance is used as a vitamin, or as a drug for cure or prevention of disease. Currently, animal tests are under way to determine growth-stimulating properties of Aureomycin, APF, and vitamin B_{12} used together. The three-way combination used on poultry recently produced greater growth than any of the ingredients alone or in pairs.

—*Chemical and Engineering News*, 28:22, May 29, 1950.

Attention, Candy-Eaters

CONFLICTING theories on tooth decay are coming to light. Anxious to find causes as a means of approaching the remedial angle, caries researchers have been studying decay from all sides. Most dental specialists

and nutritionists say that carbohydrates in "sweets" are responsible for caries. But a newer theory ignores sugars and blames caries on a chemical reaction between ever-present mouth bacteria and "some substance" in the teeth themselves. The new theory, advanced by British physiologist Paul Pincus, rests partly on evidence that bacteria free rats don't develop caries regardless of the amount of sugar in their diets.

—*Chemical and Engineering News*, 28:21. May 22, 1950.

Nurses in Industry

INDUSTRIAL *Health Review* (Industrial Hygiene Section, St. Louis Health Division) September, 1950, quotes the Committee on Professional Standards of the American Association of Industrial Nurses as follows: Duties and responsibilities of the nurses in industry: (1) Give emergency care for all occupational injuries as authorized by written standing orders signed by the physician in charge. (2) Give treatment for occupational injuries and illnesses under the supervision of the physician in charge. (3) Give emergency care for non-occupational disabilities and see that the patient is referred to his own physician for further treatment if necessary. (4) Organize and maintain a clean, smooth running, and efficient health service unit. (5) Keep currently informed about plant processes and materials. This can be accomplished by frequent tours through the plant and conferences with departments and division heads, foremen, purchasing agents and others as may be indicated. (6) Participate in pre-placement, periodic and annual medical examinations of workers. *a.* Interview workers to explain the purpose of the examination, the procedures and their significance. *b.* Obtain and record personal and occupational history of the worker. *c.* Complete as much of the examination as is approved by the physician. This may include making routine tests and measurements such as height, weight, hearing, visual acuity, urinalyses, dental inspections, taking blood pressure, pulse, temperature and respiration, and obtaining specimens for serological examination and other laboratory tests. *d.* Assist physician with physical examination as necessary and chaperone women workers. *e.* Confer with worker to interpret medical findings, plant policies for health and welfare, and to assist him

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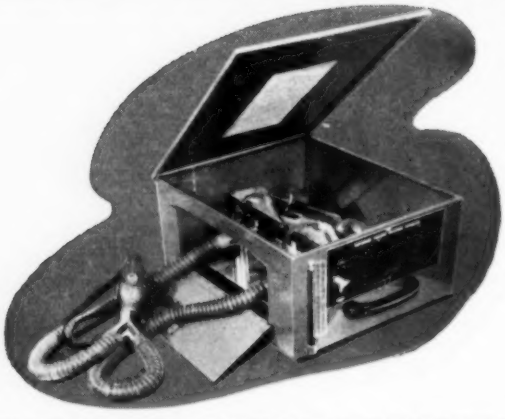

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- ***obstructive lesions of larynx or trachea including obstructive dyspneas***

In these conditions the action of oxygen or helium-oxygen mixtures is two fold. The physical effort of the subject is decreased consequently decreasing dyspnea and counteracting internal hydrostatic pressure.

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References:

1. *Pressure-Breathing with oxygen and Helium-oxygen in Pulmonary Edema and Obstructive Dyspnea, Hylan A. Bickerman, M.D., Bulletin of the New York Academy of Medicine, June 1950, Vol. 26, No. 6.*

2. *Physiological Therapy in Respiratory Diseases, Alvan L. Barach, M.D., Chapter 7, pages 120-121, 131, 156; Chapter 8, pages 162-164; Chapter 25, pages 359-361.*

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in makings plans for his necessary care. *f.* Make periodic inspections for symptoms and indications of occupational disease, as of employees working with benzene, lead or other toxic substances. *g.* Interview workers in connection with return-to-work permits to assure their fitness for work. (7) Participate in the plant health and safety educational program. *a.* Integrate health instruction in the training program for new employees. *b.* Do some health and/or safety teaching during each service to the employee. *c.* Do follow-up for correction of remedial defects. *d.* Give health supervision to workers with chronic conditions and see that they periodically consult their private physicians. *e.* Assist in the rehabilitation of employees with physical handicaps. *f.* Keep workers informed regarding current local health problems and health programs through the use of posters, pamphlets, movies or slides, and/or group talks as indicated. *g.* Contribute timely health articles to plant publications. *h.* Promote and assist in the organization of classes to meet specific needs such as personal hygiene, nutrition, etc. *i.* Assist in placement of workers according to physical and mental fitness. *j.* Analyze reports for evidence of conditions needing improvement. *k.* Attend and participate in meetings of the safety committee. *l.* Assist in the promotion and (if necessary) teaching of first aid courses for employees from each department. *m.* Promote the proper use of protective equipment and when indicated demonstrate care of such equipment. (8) Assist with plant sanitation. *a.* Know the requirements of state factory laws that pertain to illumination, ventilation, cleanliness, eating facilities and provisions for adequate toilets as well as for rest, wash and change rooms. *b.* Present suggestions to management for the improvement of all phases of plant environment that affect the health and morale of the workers. (9) Participate in plant welfare activities. *a.* Interpret (or encourage) group sick-benefit, hospitalization, and life insurance plans. *b.* Counsel workers on all health and welfare problems of concern to them. *c.* Assist in the development of recreation programs as indicated. *d.* Promote and assist in securing and maintaining adequate eating facilities for all employees. *e.* Cooperate with all community health and welfare agencies to the end that employees have adequate help in meeting their problems of non-

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Horse sense about ATHLETE'S FOOT

91 skin specialists condemn old-fashioned foot baths as being "illogical and potentially harmful to the skin."
(Archives of Dermatology and Syphilology for April, 1942.)
The best way to prevent Athlete's Foot, say these specialists, is to *stop* trying to disinfect the feet. Concentrate instead on improving the condition of the skin.

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The above statements are substantiated in tests made by Pease Laboratories, Inc. of New York, and the Department of Bacteriology of a large University. A summary of these tests is available on request.

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occupational as well as occupational origin. (10) Maintain, in confidential files, and regularly analyze employee records and health service reports. *a.* Maintain an individual record for each employee seen in the health service unit. *b.* Record every service rendered to each individual record and use this record as the basis for health counselling. *c.* Make compensation reports according to plant policy. *d.* Submit daily, weekly, or monthly, and annual reports to plant physician and/or management; and interpret such reports as evidence of accomplishments or as needs for further activities. (11) Keep abreast with developments in science, in industry, and in her profession through: *a.* Active membership in professional and civic organizations. *b.* Reading of professional and industrial magazines. *c.* Participation in study groups. *d.* Studying at a university, college, or other formal institution of learning, whenever it may be possible.

Learn How to Retire

GENERAL MOTORS is sending its older workers to school to learn how to retire. The inspiration for this school is a lecture course called "Living in the Later Years," developed by the University of Michigan and given by the university's extension service in Detroit. All older GM employees who want to can attend, and wives are encouraged to go along. Sixteen lectures cover such topics as physical and mental health, housing problems, employ-

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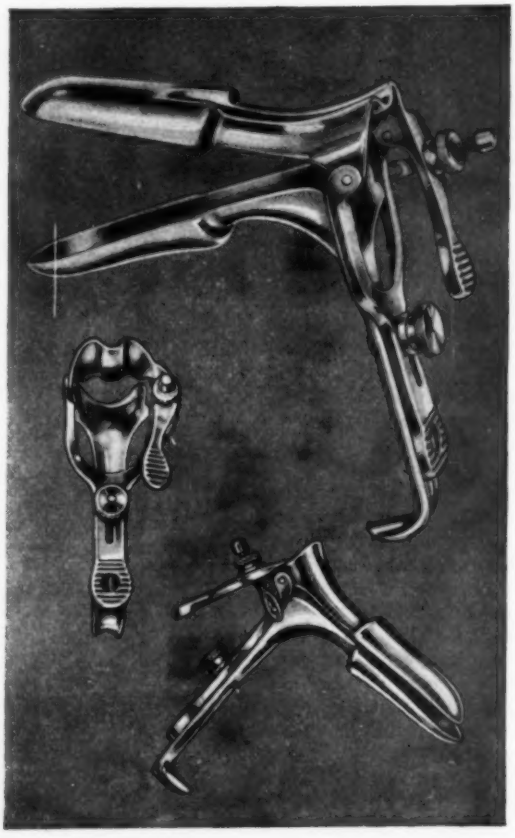

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ment and social security, recreation and "creative activities," social services, vocational training opportunities, and legal problems of the older person. Lecturers are mostly doctors, psychologists, and social workers.

—From *The Kiplinger Magazine*, in Connecticut General's *Notes & Quotes*, August, 1950.

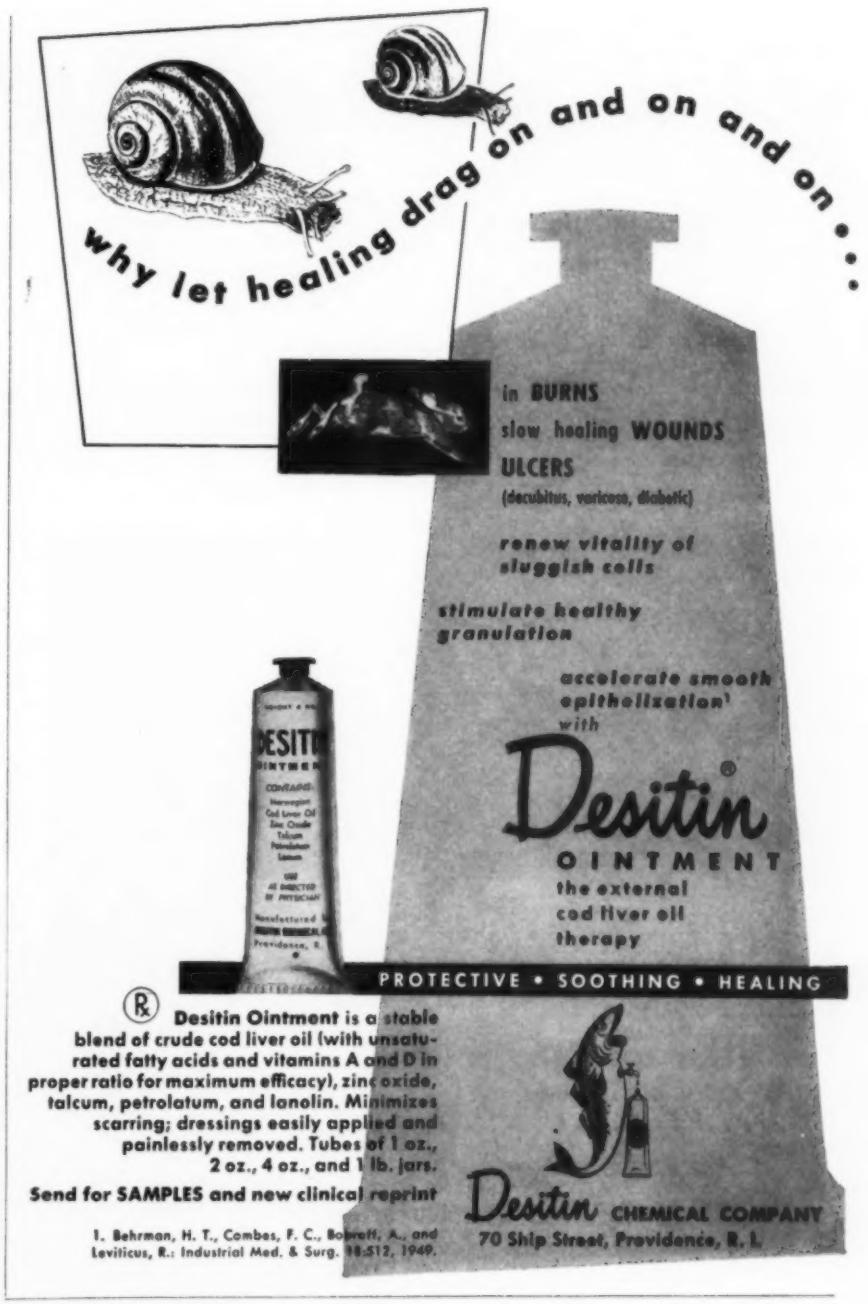
Can Do Harm

NOT ONLY have ozone generators in garages no practical effect on reducing carbon monoxide concentrations, but a recent investigation of 19 garages in Pennsylvania indicates that the use of ozone generators introduces another toxic gas in concentrations potentially harmful, according to an announcement by the U.S. Public Health Service. The Bureau of Industrial Hygiene of the Pennsylvania Department of Health made an investigation of ozone generator installations in garages of a 12-county area in the state, the announcement said. Nineteen garages where 27 ozone generators were installed were investigated. Many mechanics exposed to ozone complained of headache, nervousness, and nausea. Others stated that they had undue irritation of the nose and throat when the ozone generators were in use, and these symptoms were experienced in a somewhat greater degree by the investigators. The amount of ozone which may be safely inhaled over an eight-hour daily work period is generally accepted by authorities to be one part per million parts of air. It was found that concentrations of ozone in excess of this amount were present in 15 of the 19 garages investigated.

—*Fleet Owner*, New York City, August, 1950.

Diabetes

IN 1900, diabetes ranked 27th among the causes of death. In 1945 it was eighth. Much of the increase could be attributed to the current earlier diagnoses. Diabetes Week is scheduled for November 12 through 18. Last year's campaign uncovered approximately 7,500 hidden diabetics throughout the country—a remarkable record for a program only in its second year. The Diabetes Detection Drive, together with Diabetes Week, as sponsored by the American Diabetes Association, is a program of the medical profession, supported and approved by the American Medical Association. It is planned as a public service with no public solicitation of funds. The assistance of executives and community leaders is essential if a local drive is to be a success. Physician-members of the Committees on Diabetes of over 400 county and state medical societies will be out in full force as Diabetes Week approaches. They will be soliciting aid and cooperation, in their effort to achieve a good diabetes detection record. An outstanding example of physician-layman cooperation during last year's Diabetes Week took place in Virginia, Minnesota. In this town of over 12,000 people, 9,791 (81%) were screened for hidden diabetes. The work was done by the local Chamber of Commerce under the direction of the County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1. Behrman, H. T., Combes, F. C., Bobrott, A., and Leviticus, R.: Industrial Med. & Surg. 18:512, 1949.
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Medical Society. More than 250 volunteers canvassed the town house-to-house over a period of 16 working days, and also helped with the necessary laboratory work. So far, 50 hitherto unrecognized cases of diabetes have been diagnosed in Virginia, with more to come as the necessary medical examinations of persons showing positive urine tests proceed. It is important that employees know why they are being asked to undergo a test for the presence of diabetes. The American Diabetes Association's national office, 11 West 42nd Street, New York, has prepared a special article, directed to individual employees, which is designed for use in company and labor organization publications. Published in such outlets, the article will make acceptance of the Diabetes Detection Drive by employees much easier since they will have learned for themselves why it is important that they undergo the test. Copies of the special article may be obtained on application to the Association's New York office.

The Aged

POPULATION: There are about 11½ million persons aged 65 and over in the United States. This is almost 8% of the total population of some 150,000,000. Since 1900, the total United States population has doubled. The number of persons aged 65 and over, however, has almost quadrupled. They numbered 3,808,498 in 1900. By 1960, the population 65 years and over will be almost 15,000,000, and by 1975, almost 20,000,000, the Bureau of Census estimates. In 1850, one in every 38 Americans was past the age of 65. In 1900, the proportion was one in every 25. Today it is one in every 13. *Men and Women:* There are 90 men 65 years and over for every 100 women. In 1900 there were 102 men for every 100 women. There are 5,344,000 men and 5,926,000 women, in this age group. Two out of three of the men in this group are married, but the majority of women are widowed. The proportions of the married, widowed, divorced and single among men and women 65 years and over have not changed significantly in the past half century. *Life Expectancy:* Average life expectancy today is more than 67 years. In 1900 it was less than 50. The lengthened life span is due largely to better living conditions and to gains in the control of infectious diseases. *Causes of Death:* Chronic diseases kill about 80% of the older population. In 1948, heart disease, which caused 41.3% of the deaths among those 65 years and older was the No. 1 killer. Cancer was the second leading cause, and responsible for almost 14% of the deaths in the older group. In 1900, heart disease was also the leading cause of death among older people. Cancer was fifth. The incidence of chronic disease among persons 65 years and over is about three times as high as in the general population. *Dwelling places:* Fewer than 3% of the population aged 65 and older live in institutions. About four-fifths of them live with some members of their family, either distantly or closely related. In 1940, the latest year for which information is available, 221,965 persons 65 and over lived in institutions. This included 125,630 in homes for aged, infirm, or needy; 87,974 in mental institutions; 4,686 in

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prisons or jails. *Income:* Of almost 11½ million persons aged 65 and over, more than 3½ million have absolutely no money income. This includes about 600,000 men and about 3 million women. About one-half of these women, however, are married and living with a husband who may have some income. More than 2 million people aged 65 and over have incomes of less than $500. Another 2 million have incomes between $500 and $1,000. About one-third of those aged 65 or more, or almost 4 million, are wage earners or wives of wage earners. About one-fourth of the aged are covered by some kind of social insurance, including 17% who receive old-age and survivors insurance benefits. Old-age and survivors insurance goes to 1,900,000; railroad retirement to 300,000; Federal civil service retirement benefits to 100,000; veterans program to 300,000. Some 2,700,000 receive old-age assistance coverage.

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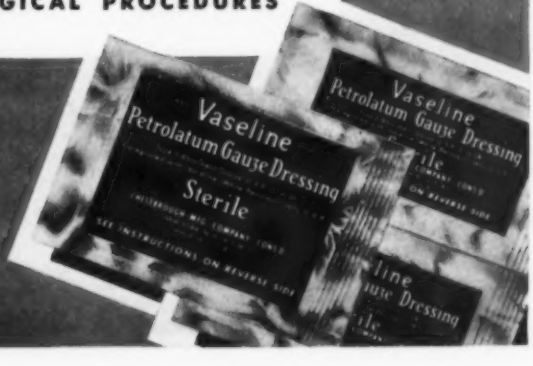

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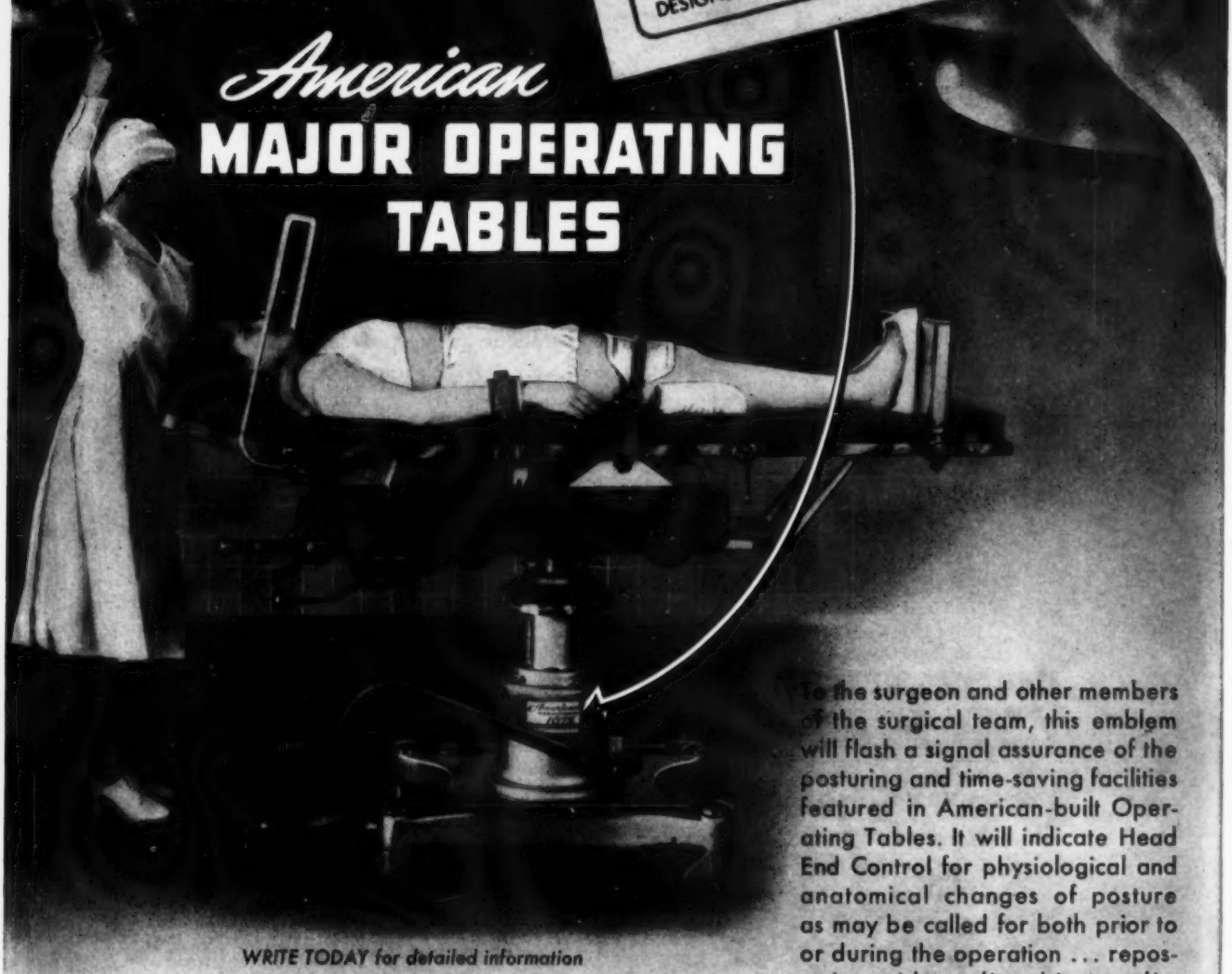

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*Schwartz, L., et al; Industrial Medicine, 18:6, 257-258, June, 1949.

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***From the Lahey Clinic Bulletin** (Vol. 4, No. 8, April 1946): "The water-soluble chlorophyll containing ointment (*Chloresium*) has now been used at this clinic in more than 50 cases of the more chronic and difficult ulcers . . . (it) apparently excels any of the previously used agents . . . Many patients who had ulcers unhealed from one to eight years obtained complete healing in six to ten weeks."

***From the Guthrie Clinic Bulletin** (Vol. 16, No. 1, July 1946): "We have used a water-soluble ointment of chlorophyll (*Chloresium*) in a variety of conditions . . . with splendid results in a vast majority of cases. In a group of chronic ulcers there has been almost universal prompt and early healing."

Try Chloresium on your most resistant case—it is nontoxic, bland, soothing, deodorizing.

*Complete reprints available on request.

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I want to try Chloresium Ointment and Chloresium Solution (Plain). Please send clinical samples.

*Dr.*_____

*Address*_____

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Chloresium
REG. U.S. PAT. OFF.

Therapeutic chlorophyll preparations

Solution (Plain); Ointment; Nasal and Aerosol Solutions

Ethically promoted—at leading drugstores

U. S. Pat. 2,120,667—Other Pats. Pend.

A NEW COMPOUND TO MULTIPLY THERAPEUTIC EFFECT IN DEFICIENCY CONDITIONS

(B VITAMINS AND MINERALS)

HADACOL

In Liquid Form Recommended in Sub-clinical Deficiencies

HADACOL
(2 Fl. Ozs.) Contain the
VITAMINS
B1 (Thiamin Hydrochloride) . . . . . 6 mg.
B2 (Riboflavin) . . . . . 4 mg.
Niacinamide . . . . . 40 mg.
B6 (Pyridoxine) . . . . . 2 mg.
Pantothenic Acid . . . . . 4 mg.
Plus the
MINERALS
Iron . . . . . 166 mg.
Manganese . . . . . 90 mg.
Calcium . . . . . 250 mg.
Phosphorus . . . . . 250 mg.
Alcohol 12% as a Preservative
MANUFACTURED BY
THE LeBLANC CORP.
LAFAYETTE, LOUISIANA, U.S.A.

Available in this well-balanced product are optimum requirements of Vitamins B_1, B_2, Iron and Niacin with beneficial amounts of Calcium, Phosphorus and Manganese. The form is stable and palatable; the elements readily assimilable.

HADACOL is especially indicated in febrile and debilitated cases, supplementing essential elements lost through restricted diets. Effective in both pre- and post-operative cases. Acceptable to old and young alike.

THE LeBLANC CORPORATION, Lafayette, Louisiana

One Picture RIASOL is worth 1000 words about PSORIASIS

Before Riasol Treatment

After Riasol Treatment

One photograph after a course of treatment, compared with the original, tells the whole story of what RIASOL can do in psoriasis. Words are unnecessary.

As documented by numerous photographic records in our files, the scaly patches clear up in most cases in a period of weeks. The reddened base fades gradually, leaving the skin of normal appearance, and in many cases there is no recurrence for very long periods.

An unusually effective prescription, RIASOL may be applied to any part of the body, including the face and scalp. Because it is simple, convenient and pleasant to use, patients generally follow instructions faithfully.

RIASOL contains 0.45% mercury chemically combined with soaps. 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages required. After one week, adjust to patient's progress.

Ethically promoted RIASOL is supplied in 4 and 8 fld. oz. bottles, at pharmacies or direct.

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Please send me professional literature and generous clinical package of RIASOL.

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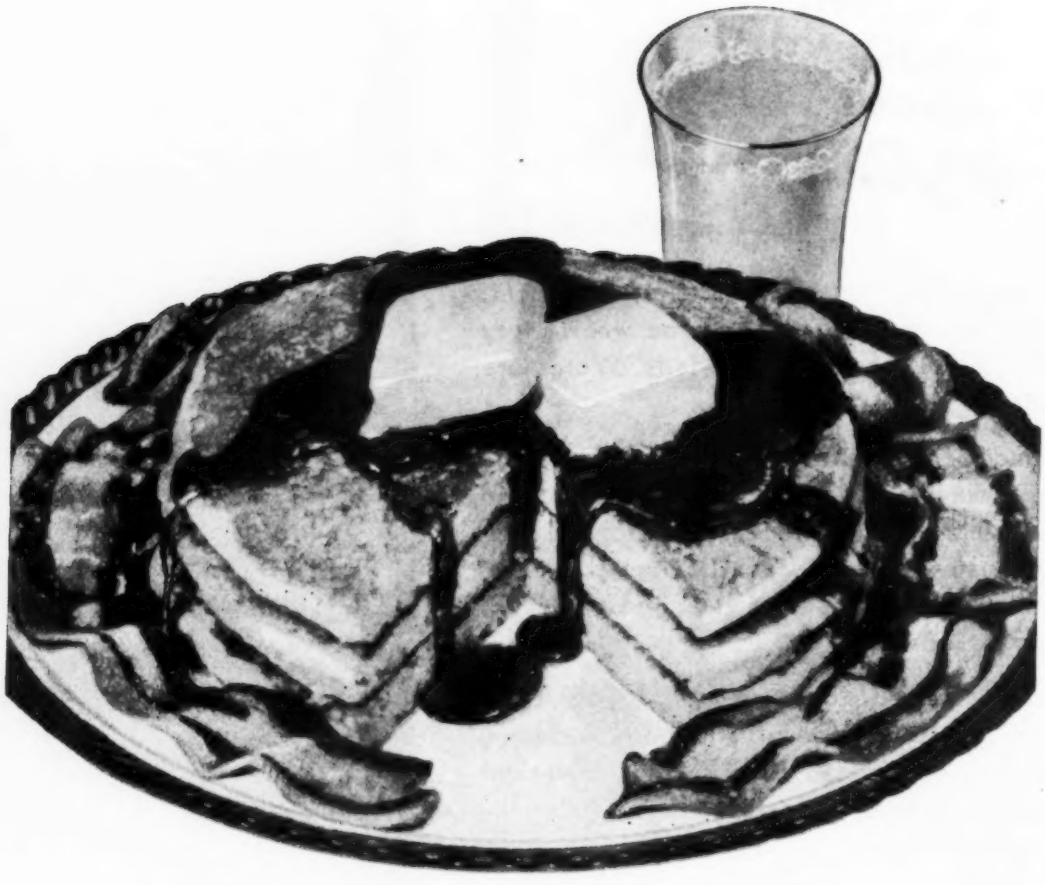
RIASOL for PSORIASIS



A Real American Breakfast

That a nutritious breakfast providing generous amounts of high quality protein prevents late morning hypoglycemia has been amply demonstrated. As shown by Thorn and co-workers,[1] and later confirmed by Orent-Keiles,[2] ". . . breakfast high in protein and low in fat and carbohydrate was followed by an improved sense of well-being and no symptoms of hypoglycemia."

Meat for breakfast—ham, sausage, bacon, breakfast steaks—is an appetizing means of increasing the protein content of the morning meal. Its biologically complete protein contains all essential amino acids, and serves well in complementing less complete proteins from other sources. Furthermore, muscle meat is an outstanding source of B complex vitamins and of iron.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

(1) Thorn, G.W.; Quinby, J.T., and Marshall, C., Jr., Ann. Int. Med. 18:913 (June) 1943.
(2) Orent-Keiles, E., and Hallman, L. F., Circular No. 827, United States Department of Agriculture, Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, Dec., 1949.

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Main Office, Chicago... Members Throughout the United States

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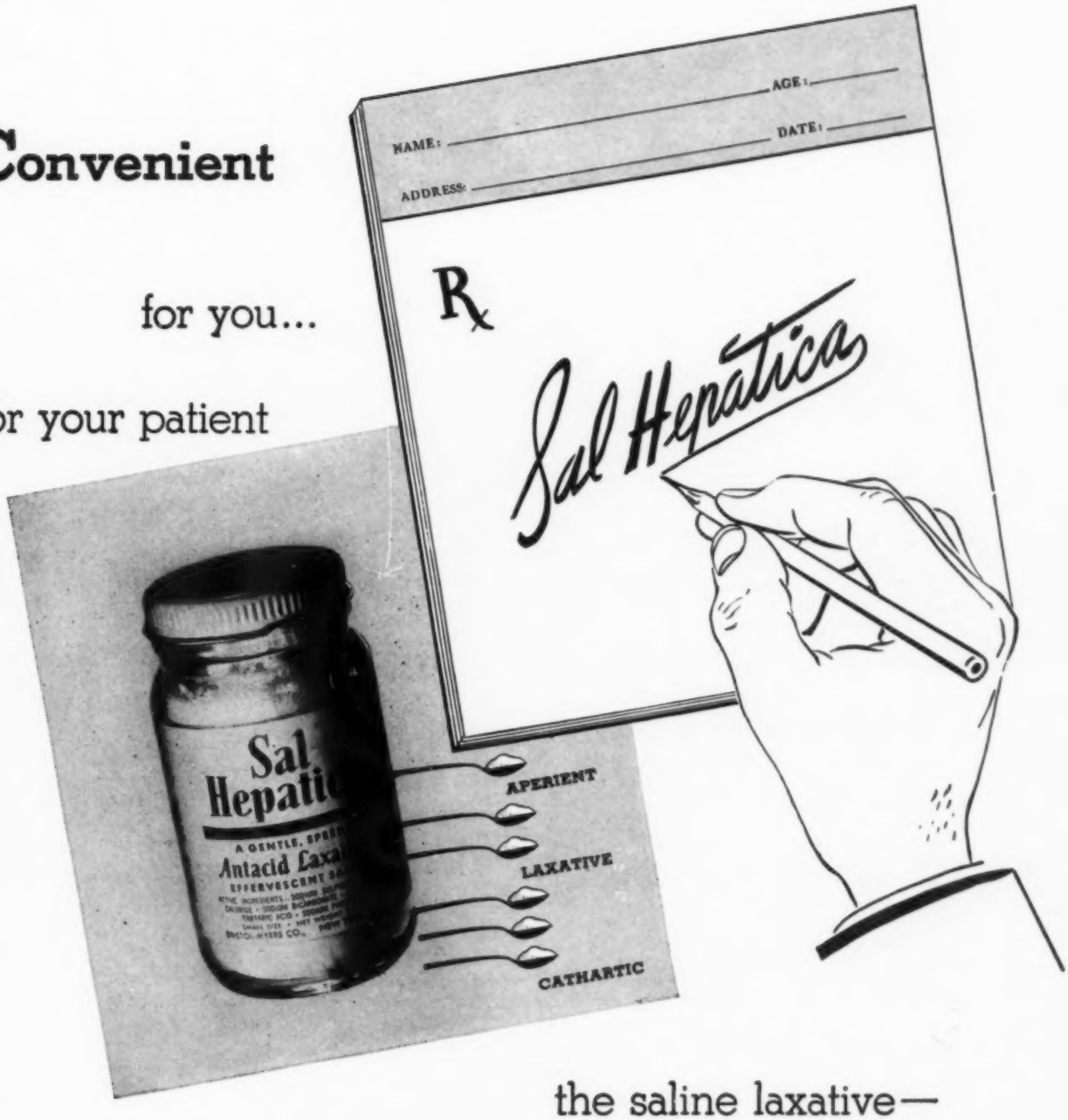
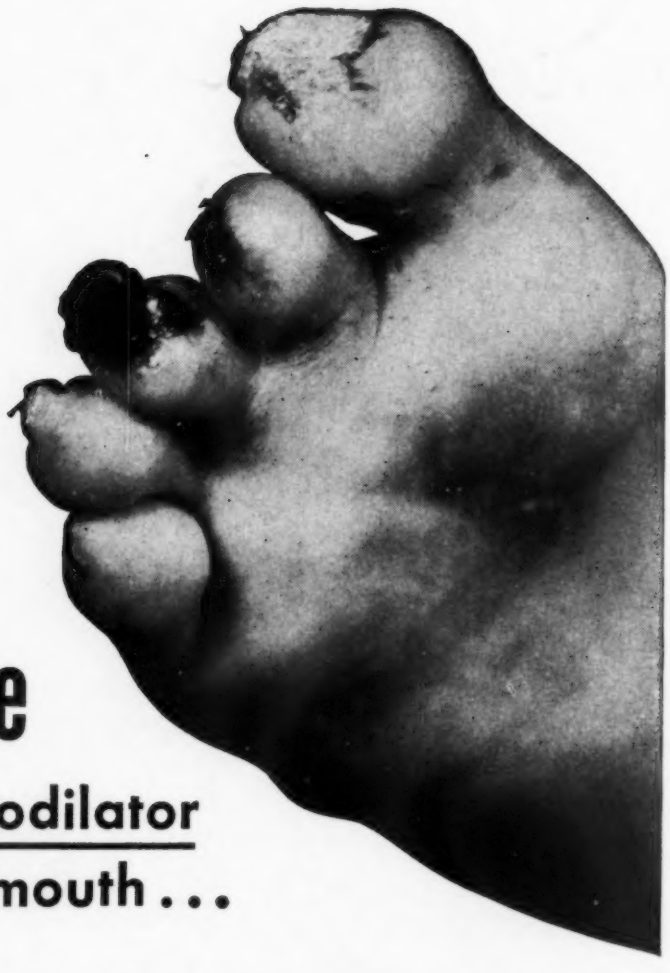


the saline laxative—

Whether your patient needs a laxative, or an aperient, or a cathartic you'll find it more convenient to write SAL HEPATICA on your prescription pad. No need to specify all the ingredients of three separate formulas, just prescribe SAL HEPATICA and indicate the dosage.

Your patients will find SAL HEPATICA convenient, too. No cluttering of shelves with bottles of different laxatives when one will serve. They'll like its pleasant taste, its effervescence—and, of course, its prompt, gentle action.

a product of **BRISTOL-MYERS** • **19 West 50 Street, New York 20, N. Y.**



Priscoline

A potent vasodilator effective by mouth...

Priscoline hydrochloride "has a definite place in the armamentarium of drugs... particularly in the field of *peripheral vascular disease*, or for conditions of visceral pain due to vascular spasm. Presumably the drug can be used to a great advantage in those cases in which sympathectomy would be advantageous. . . . It can also be used as a substitute for paravertebral sympathetic block."[1]

"Priscoline per se appeared to slow down progression of the disease and produce symptomatic benefits in 88 per cent of 25 patients with early proliferative and degenerative *arthritis* involving peripheral joints."[2]

In doses of 25 to 75 mg., administered either orally or parenterally, Priscoline "usually is tolerated with few side effects."[3]

Comprehensive literature on request.

1. Rogers, Max P.: J.A.M.A., May 21, 1949
2. Wyatt, Bernard L.: Ann. West. Med. & Surg., Aug. 1949
3. Grimson, Marzoni, Reardon & Hendrix: Ann. Surg., 127:5, May 1948

PRISCOLINE, Tablets of 25 mg.; 10 cc. Multiple-dose Vials, each cc. containing 25 mg.

Ciba PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

PRISCOLINE (brand of benzazoline) Trade Mark Reg. U. S. Pat. Off. 2/1967M